

<b>FR</b>	2-3 / 4-19 / 86-96
<b>EN</b>	2-3 / 20-35 / 86-96
<b>DE</b>	2-3 / 36-51 / 86-96
<b>NL</b>	2-3 / 52-68 / 86-96
<b>IT</b>	2-3 / 69-85 / 86-96

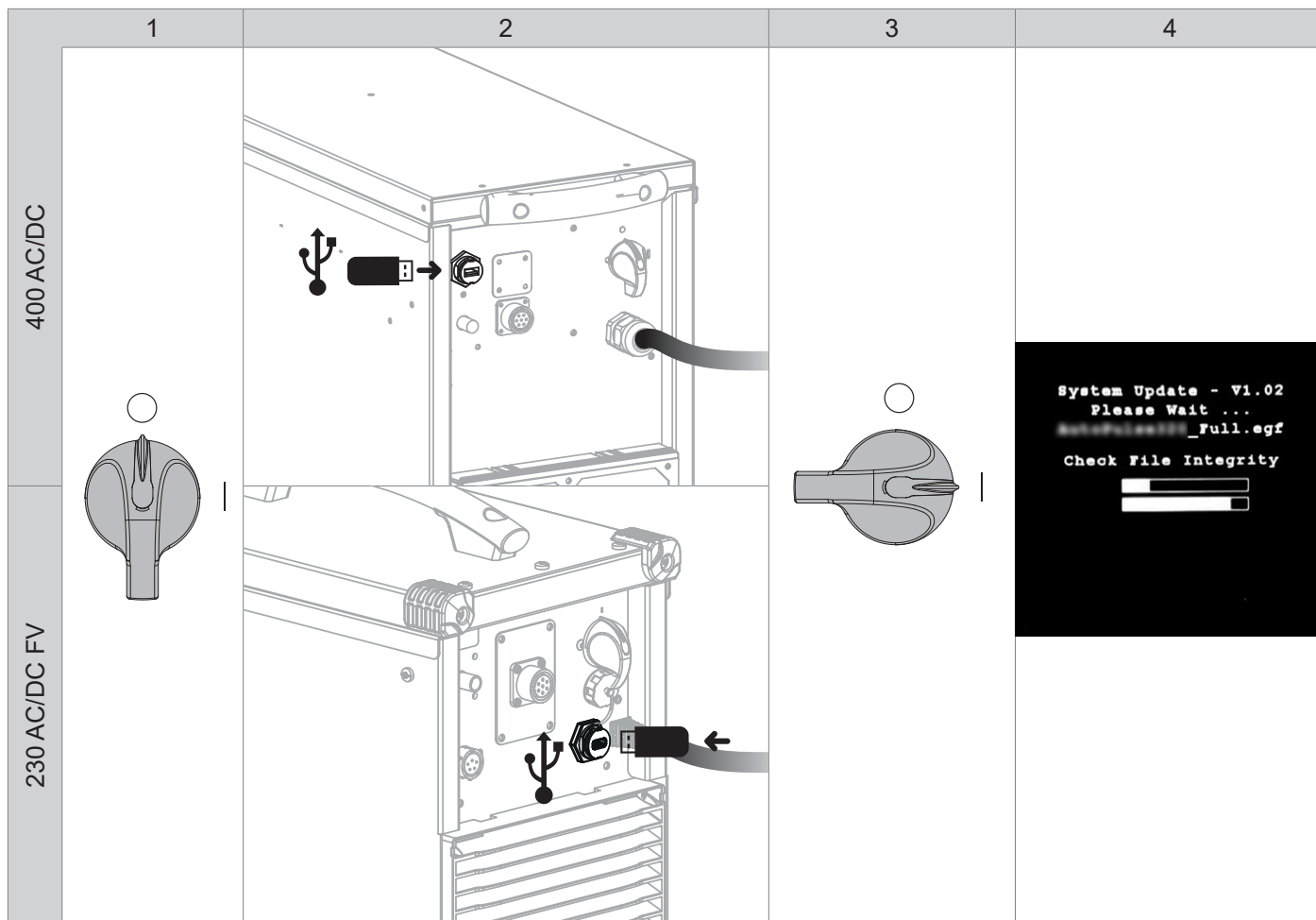
## **TITANIUM 400 AC/DC**

### **TITANIUM 230 AC/DC FV**

Générateur TIG AC/DC - MMA  
TIG AC/DC - MMA welding machine  
Schweissgerät für WIG AC/DC - E-Hand  
Equipo de soldadura TIG AC/DC - MMA  
TIG AC/DC - MMA lasapparaat  
Dispositivo saldatura TIG AC/DC - MMA

**1ÈRE UTILISATION / ERSTE VERWENDUNG / FIRST USE / ПЕРВОЕ ИСПОЛЬЗОВАНИЕ / 1° UTILIZZO / EERSTE GEBRUIK / PRIMERA UTILIZACIÓN / 1° USO / 首次使用 / 初めてご使用になる前に**

- FR** Avant la première utilisation de votre appareil, merci de vérifier la présence de nouvelles mises à jour.
- EN** Before using your device for the first time, please check for new updates.
- DE** Vor der ersten Anwendung des Gerätes bitte prüfen Sie, ob neue Softwareaktualisierungen verfügbar sind.
- ES** Antes del primer uso de su aparato, compruebe la presencia de nuevas actualizaciones.
- RU** Перед тем как использовать аппарат проверьте нет обновлений программного обеспечения.
- NL** Voordat u het apparaat voor de eerste keer gebruikt, moet u de aanwezigheid van nieuwe updates controleren.
- IT** Prima di utilizzare per la prima volta il vostro apparecchio, vogliate verificare se ci sono nuovi aggiornamenti.
- PT** Antes de utilizar o seu dispositivo pela primeira vez, verifique se existem novas atualizações.
- CN** 首次使用设备前，请检查是否存在更新。
- JP** 初めて使用する前に、デバイスが最新にアップデートされているか確認してください。

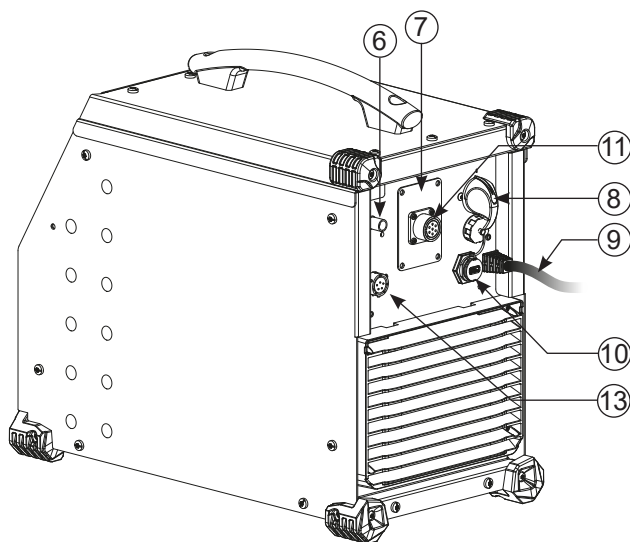
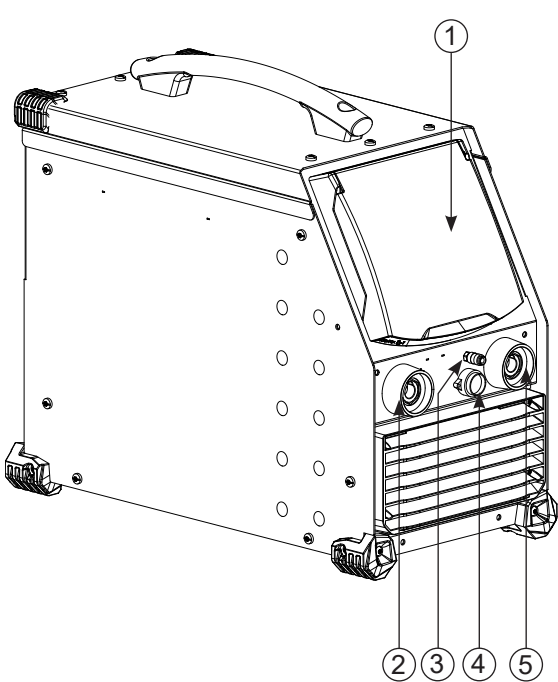


- FR** Avant la première utilisation de votre appareil, procédez à la calibration des câbles de soudage.
- EN** Before using the machine for the first time, calibrate the welding cables.
- DE** Kalibrieren Sie die Schweißkabel vor der ersten Benutzung Ihres Geräts.
- ES** Antes de utilizar su aparato por primera vez, calibre los cables de soldadura.
- RU** Перед первым использованием проведите калибровку сварочных кабелей.
- NL** Voordat u dit apparaat voor de eerste keer gebruikt moeten de laskabels gekalibreerd worden.
- IT** Prima di effettuare il primo utilizzo del vostro apparecchio, procedere alla calibrazione dei cavi di saldatura.
- PT** Antes de utilizar o seu aparelho pela primeira vez, proceda à calibração dos cabos de soldadura.
- CN** 首次使用设备前，请先校准焊接电缆。
- JP** デバイスを初めて使用する前に、溶接ケーブルを較正してください。

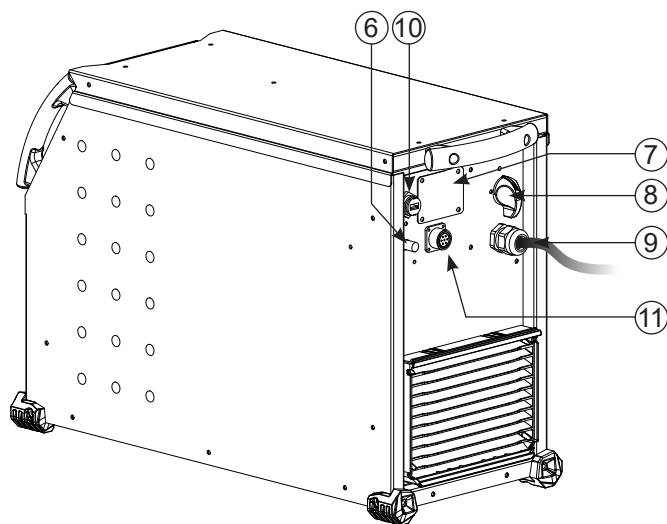
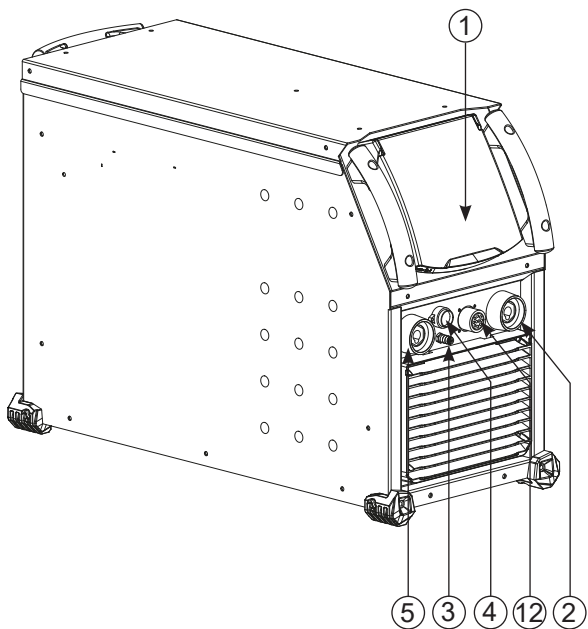


I

230 AC/DC FV



400 AC/DC



## WARNINGS - SAFETY REGULATIONS

### GENERAL INFORMATION



These instructions must be fully read and understood before operating the machine.  
Do not carry out any modifications or maintenance work that is not included in the user manual.

Any personal injury or material damage due to use that does not comply with the instructions in this manual cannot be held at the expense of the manufacturer.

If you have a problem or query, please consult a qualified technician to set up the device correctly.

### THE ENVIRONMENT

This equipment should only be used for welding operations within the limits indicated on the rating plate and/or in the user manual. The safety regulations must be observed. In the event of improper or dangerous use, the manufacturer shall not be held liable.

The device must be set up and operated in a location that is free of dust, acids, flammable gases and other corrosive substances. The same applies to the device's storage. Make sure there is sufficient air circulation when in use.

Temperature ranges:

Use between -10 and +40°C (+14 and +104°F).

Store between -20 and +55°C (-4 and 131°F).

Air humidity:

Less than or equal to 50% at 40°C (104°F).

Less than or equal to 90% at 20°C (68°F).

Altitude:

Up to 1,000 m above sea level (3,280 feet)

### PROTECTING YOURSELF AND OTHERS

Arc welding can be dangerous and cause serious injury or death.

Welding exposes people to a dangerous source of heat, light and radiation from the arc as well as electromagnetic fields (caution to those with pacemakers), risk of electrocution, noise and gaseous fumes.

To protect yourself and others, follow these safety instructions:



To protect yourself from burns and radiation, wear insulating, dry, fireproof clothing in good condition without lapels; the clothing must cover the whole body.



Wear gloves that provide electrical and thermal insulation.



Use welding PPE and/or a welding helmet with a sufficient protection level (depending on the application). Protect your eyes during cleaning operations. Wearing contact lenses is strictly forbidden.

It is sometimes necessary to enclose the welding area with fireproof curtains to protect it from arc radiation, spatter and incandescent waste.

Inform people in the welding area not to look at the arc rays or the molten parts and to wear the appropriate clothing to protect themselves.



Wear noise-cancelling headphones if the welding process reaches a noise level above the permissible limit (these must be worn by anyone in the welding area).

Keep hands, hair and clothing away from moving parts (the fan).

Never remove the cooling unit's protective casing when the welding power source is on; the manufacturer cannot be held responsible in the event of an accident.



Newly welded parts are hot and can cause burns when handled. When carrying out maintenance on the torch or electrode holder, make sure that it has sufficiently cooled by waiting at least 10 minutes before starting any work. The cooling unit must be switched on when using a water-cooled torch to make sure that the liquid does not cause burns.

It is important to secure the work area before leaving it, this is to protect people and property.

### WELDING FUMES AND GASES



The fumes, gases and dusts emitted by welding are health hazards. Sufficient ventilation must be provided and an air supply may be required. An air-fed mask could be a possible solution if there is inadequate ventilation.

Check that the extraction system is operating effectively by checking it against relevant safety standards.

Caution: welding in confined environments requires remote monitoring for safety reasons. Furthermore, welding certain materials that contain lead, cadmium, zinc, mercury or even beryllium, can be particularly harmful; it is important to thoroughly degrease the parts before welding them.

Gas cylinders must be stored in an open or well-ventilated area. They must be in an upright position and held on a support or on a trolley.

Do not weld near grease or paint.

**FIRE AND EXPLOSION RISK**



Fully shield the welding area; flammable materials should be kept at least 11 metres away. Fire fighting equipment must be nearby during welding operations.

Beware of hot material or sparks being projected, even through cracks; they can cause a fire or explosion.

Keep people, flammable objects and pressurised containers at a safe distance.

Welding in closed containers or tubes should be avoided and if they are open they should be emptied of any flammable or explosive material (oils, fuels and gas residues, etc.).

Grinding operations must not be directed towards the welding power source or towards any flammable materials.

**GAS CYLINDERS**



The gas coming out of the gas cylinders can cause suffocation if it becomes concentrated in the welding area (ventilate well). Transportation must be done carefully and safely: gas cylinders must be shut off and the welding power source must be switched off. They must be stored vertically and supported to limit the risk of falling.

Close the gas cylinder between uses. Beware of temperature variations and sun exposure.

The gas cylinder must not come into contact with flames, electric arcs, torches, earth clamps or any other heat or incandescent sources.

Be sure to keep it away from electrical and welding circuits and, therefore, never weld a pressurised cylinder.

Be careful when opening the gas cylinder's valve, keep your head away from the valve and make sure that the gas used is suitable for the welding process.

**ELECTRICAL SAFETY**



The electrical power supply must be earthed. Use the fuse size recommended on the information panel. Electric shocks can cause serious direct or indirect accidents and even death.

Never touch live parts inside or outside the live power source (torches, clamps, cables and electrodes) as these parts are directly connected to the welding circuit.

Before opening the welding current source, it must be disconnected from the mains and wait 2 minutes. so that all the capacitors are discharged.

Do not touch the torch or electrode holder and the earth clamp at the same time.

Make sure to have the cables and torches replaced by a qualified and authorised technician if they become damaged. Select the cable's cross-section size according to the intended application. Always wear dry, undamaged clothing to insulate yourself from the welding circuit. Wear insulated footwear in all work environments.

**THE EQUIPMENT'S EMC CLASSIFICATION**



This Class A equipment is not suitable for use in a residential setting where power is supplied from the public, low voltage, supply network. There may be difficulties in ensuring electromagnetic compatibility at these sites, this is due to both conducted and radiated radio frequency interference.



TITANIUM 230 AC/DC FV:

Provided that the public, low-voltage, supply-network impedance at the point of common coupling is less than  $Z_{max} = 0.173$  Ohms, this equipment complies with standard IEC 61000-3-11 and can be connected to public, low-voltage supply networks. The installer or user of the equipment is responsible for ensuring that the network impedance complies with the impedance restrictions, this may involve consulting with the distribution network operator if necessary.



TITANIUM 400 AC/DC:

This material complies with IEC 61000-3-11.

TITANIUM 230 AC/DC FV:

This material complies with IEC 61000-3-12.

TITANIUM 400 AC/DC:

This equipment does not comply with IEC 61000-3-12 and is intended to be connected to private, low-voltage networks that are connected to the public supply network only at medium- and high-voltage levels. If connected to a public, low voltage supply network, it is the installer's or user's responsibility to ensure that the equipment can be connected to the power supply by consulting with the distribution network operator.

**ELECTRO-MAGNETIC EMISSIONS**



An electric current passing through any conductor produces localised electric and magnetic fields (EMF). The welding current produces an electromagnetic field around the welding circuit and the welding equipment.

Electromagnetic fields (EMF) can interfere with some medical implants, such as pacemakers. Protective measures must be taken for people with medical implants. For example, restricted access for passers-by or an individual risk assessment for welding professionals.

All welders must carry out the following procedures to minimise exposure to electromagnetic fields from the welding circuit:

- position the welding cables together and secure them with a clamp, if possible
- position yourself (head and torso) as far away from the welding circuit as possible
- never wrap the welding cables around your body
- do not position your body between the welding cables • keep both welding cables on the same side of your body
- connect the return cable to the workpiece as close as possible to the area to be welded
- do not work next to, sit on or lean against the welding power source
- do not weld when transporting the welding power source or the wire-feed reel



Those with pacemakers should consult a physician before using this equipment.  
Exposure to electromagnetic fields during the welding process may have other health effects that are not yet known.

## RECOMMENDATIONS FOR EVALUATING THE WELDING AREA AND SET UP

### General Information

The user is responsible for setting up and using the arc-welding equipment according to the manufacturer's instructions. If electromagnetic interference is detected, it is the arc-welding equipment user's responsibility to resolve the situation with the manufacturer's technical assistance. In some cases, this corrective action may be as simple as earthing the welding circuit. In other cases, an electromagnetic shield may need to be constructed around the welding power source as well as the entire workpiece with input filters installed. In all instances, electromagnetic interference should be reduced until it is no longer a concern.

### Assessing the Welding Area

Before setting up arc-welding equipment, the user must assess the potential electromagnetic issues in the surrounding area. The following should be taken into account:

- (a) the presence of other power, control, signal and telephone cables either above, below or next to the arc-welding equipment
- (b) radio and television receivers and transmitters
- (c) computers and other control equipment
- (d) safety-critical equipment, such as industrial equipment safeguarding
- (e) the health of people nearby, for example, those with pacemakers or hearing aids
- (f) the calibration or measurement equipment used
- (g) the immunity of other equipment located nearby

The user must verify that the other equipment used in the surrounding environment is compatible. This may require additional protective measures:

- (h) the time of day when welding or other activities are to be carried out

The size of the surrounding area to be taken into account depends on the structure of the building and other activities taking place there. The surrounding area may extend beyond the facility's boundaries.

### Assessing the Welding Equipment

In addition to assessing the surrounding area, the arc-welding equipment can also be assessed to identify and resolve instances of disturbance. The emissions assessment should include in situ readings as specified in Article 10 of CISPR 11. In situ readings can also be used to confirm whether the mitigation measures are effective.

## RECOMMENDATIONS ON METHODS FOR REDUCING ELECTROMAGNETIC EMISSIONS

**a. Public power supply network:** Arc-welding equipment should be connected to the public power supply following the manufacturer's recommendations. If interference occurs, it may be necessary to take additional preventive measures such as filtering the public power supply. Consider shielding the power cable within a metal conduit or equivalent for permanently set up arc-welding equipment. The shielding must be electrically continuous along its entire length. The shielding should be connected to the welding power source to ensure good electrical contact between the conduit and the welding power source's casing.

**b. Maintaining arc-welding equipment:** Arc-welding equipment must undergo routine maintenance according to the manufacturer's recommendations. All accesses, service doors and covers should be closed and properly locked when the arc-welding equipment is in use. The arc-welding equipment must not be modified in any way, except for those modifications and adjustments specified in the manufacturer's instructions. In particular, the arc ignition and stabiliser's spark gap must be adjusted and maintained according to the manufacturer's recommendations.

**c. Welding cables:** The welding cables should be as short as possible and placed close together near or on the ground.

**d. Equipotential bonding:** Consider linking together all metal objects in the surrounding area. However, metal objects connected to the workpiece will increase the risk of electric shocks to the user if they touch both the metal objects and the electrode. Therefore, the operator must be isolated from such metal objects.

**e. Earthing the workpiece:** Where the part to be welded is not earthed for electrical safety reasons or because of its size and location, e.g. a ship's hulls or a building's structural steel framework, an earthed connection can, in some cases but not always, reduce emissions. Care should be taken to avoid earthing parts which could increase the risk of injury to users or damage to other electrical equipment. If necessary, the workpiece's earth connection should be made directly. However, in certain countries where this direct connection is prohibited, the connection should be made with a suitable capacitor chosen in accordance with national regulations.

**f. Protective and shielding measures:** Selectively protecting and shielding other cables and equipment in the surrounding area can limit interference issues. Protecting the entire welding area could be an option for special applications.

## TRANSPORTING AND MOVING THE WELDING MACHINE



The welding power source is equipped with a top handle allowing it to be carried by hand. Be careful not to underestimate the weight of the machine. The handle is not intended as a means of hoisting or suspending the machine.

Do not use the cables or torch to move the welding current source. It must be moved in an upright position.  
 Do not carry the welding machine over people or objects.  
 Never lift a gas cylinder and the welding current source at the same time. They have different transportation requirements.

**SETTING UP THE EQUIPMENT**

- Place the welding power source on a floor with a maximum inclination of 10°.
  - Provide a sufficient area to properly ventilate the source of the welding current and access the machine's controls.
  - Do not use in an environment with conductive metal dust.
  - The welding power source must be protected from heavy rain and out of direct sunlight.
  - The equipment has an IP23 protection rating, meaning:
    - it is protected against dangerous access by solid bodies with a diameter >12.5 mm
    - it is protected against rain falling at 60° to the vertical
- This equipment is, therefore, suitable for outdoor use in accordance with its IP23 protection rating.

Power, extension and welding cables must be fully unwound to avoid overheating.



The manufacturer assumes no responsibility for damage to persons and objects caused by improper or dangerous use of this equipment.

**MAINTENANCE / ADVICE**



- Maintenance should only be carried out by a qualified technician. Annual maintenance is recommended.
- Switch off the power supply by disconnecting the plug and waiting for two minutes before carrying out work on the equipment. Inside, the voltages and intensities are high and dangerous.

- Regularly remove the cover and blow out the dust. Take the opportunity to have the electrical connections checked by a qualified technician using an insulated tool.
- Check the power cable's condition regularly. If the power cable is damaged, it must be replaced by the manufacturer, their after-sales service department or a similarly qualified technician to avoid hazards.
- Leave the welding power source's vents free to allow air to enter and exit the machine.
- Do not use this welding power source for thawing pipes, recharging batteries/accumulators or starting motors.

**SETUP - OPERATING THE PRODUCT**

Only experienced persons, authorised by the manufacturer, may set up the device. During setup, ensure that the power source is disconnected from the mains system. Serial or parallel power source connections are not allowed. It is recommended to use the welding cables supplied with the unit in order to achieve the product's optimum settings' configuration.

**DESCRIPTION**

This equipment is a power source for TIG welding with a direct current (DC TIG) or an alternating current (AC TIG) as well as for coated-electrode welding (MMA).

**EQUIPMENT DESCRIPTION (I)**

- |                                  |  |
|----------------------------------|--|
| 1) Human Machine Interface (HMI) | 7) Digital TIG-1 kit connection (optional extra, P.N. 037960)      |
| 2) Positive polarity socket      | NUM-1 kit connection (option ref. 063938) = 230 AC/DC FV only      |
| 3) Torch gas connection          | 8) ON/OFF Switch   |
| 4) Torch button connection       | 9) Power supply cable  |
| 5) Negative polarity socket      | 10) USB connection   |
| 6) Cylinder gas connection       | 11) Analogue connection  |
|                                  | 12) Reel or remote HMI connection = 400 AC/DC only                 |
|                                  | 13) Power supply connection and cooling unit management connection |

**HUMAN-MACHINE INTERFACE (HMI)**



Please read the Human Machine Interface (HMI) user manual which forms part of the complete hardware documentation.

**POWER SUPPLY-START-UP**

**TITANIUM 230 AC/DC FV:**

This equipment is delivered with a single-phase, three-pin (E/N/L), 230 V/16 A, CEE17 socket. It comes equipped with «Flexible Voltage» technology and can be supplied from an earthed electrical installation between 110 - 240 V (50 - 60 Hz).

**TITANIUM 400 AC/DC:**

This equipment is fitted with a 32 A, EN 60309-1 socket and should only be used on a three-phase, 400 V (50 - 60 Hz), four-wire electrical network with an earthed neutral pin.



The effective absorbed current (I<sub>1eff</sub>) for the ideal operating conditions is indicated on the equipment. Check that the power supply and its safeguards (the fuse and/or circuit breaker) are compatible with the required current. It may be necessary to change the plug in some countries to allow the product to operate at its optimum conditions.

- The welding current source will go into a protective mode if the supply voltage goes below or above 15% of the specified voltage(s) (a fault code will appear on the display).
- Switching the device on is done by turning the ON/OFF switch (I-8) to the I position; conversely, switching it off is done by turning it to the 0 position. Warning! Never turn off the power supply when the machine is charging.
- Fan performance: This equipment is fitted with an intelligent ventilation management system to minimise the machine's noise level. The fans will adapt their speed to match the device's current application and the ambient temperature. The fan will run continuously in MMA mode. In TIG mode, the fan will only run during the welding phase and then stop after cooling.
- Warning: increasing the length of the torch or return cables beyond the maximum length specified by the manufacturer will increase the risk of electric shock.
- Arc ignition and arc stabilising are both designed for manual and mechanically guided operations.

### CONNECTING TO THE POWER SOURCE

This equipment can be operated using battery-based power sources provided that the auxiliary power meets the following requirements:

- The voltage must be alternating, set as specified and with a peak voltage of less than 700 V for the TITANIUM 400 AC/DC and 400 V for the TITANIUM 230 AC/DC FV
- The frequency must be between 50 - 60 Hz

Checking these conditions is crucial as many power sources produce high voltage spikes that can damage equipment.

### USING ELECTRICAL EXTENSION CABLES

All extension cables must be of an appropriate length and cross-section for the equipment's voltage. Use an extension cable that complies with national regulations.

	Input voltage	Length - Extension cable cross-section	
		< 45 m	> 45 m
TITANIUM 400 AC/DC	400 V	6 mm <sup>2</sup>	
TITANIUM 230 AC/DV FV	110 V	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>
	230 V	2.5 mm <sup>2</sup>	

### GAS CONNECTION

This equipment is equipped with two couplings. A cylinder coupling for putting gas into the device and a torch gas coupling for releasing gas from the end of the torch. We recommend that you use the adaptors supplied with the welding machine to ensure optimum connections.

### ACTIVATING THE VRD FEATURE (VOLTAGE REDUCTION DEVICE)

The voltage reducing device (or VRD) is only available for the TITANIUM 230 AC/DC.

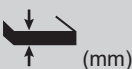
This device protects the welder. The welding current is delivered only when the electrode makes contact with the workpiece (low resistance). The VRD function lowers the voltage as soon as the electrode is removed.

The voltage reduction device is deactivated by default. In order to activate it, the user must first open the product and complete the following procedure:

- 1.) DISCONNECT THE PRODUCT FROM THE POWER SUPPLY and wait for five minutes to ensure that it is safe.
- 2.) Remove the power source's side panel (see page 89).
- 3.) Locate the control board and VRD switch (see page 89).
- 4.) Turn the switch to the ON position.
- 5.) The VRD function is now activated.
- 6.) Replace the power source's side panel.
- 7.) The VRD icon on the device's user interface (HMI) will now be lit up.

To deactivate the VRD function, simply switch the switch back to the OFF position.

### RECOMMENDED COMBINATIONS

	 (mm)	Amps (A)	Electrode Ø (mm)	Nozzle Ø (mm)	Argon Flow Rate (L/min)
DC TIG	0.3 - 3	3 - 75	1	6.5	6 - 7
	2.4 - 6	60 - 150	1.6	8	6 - 7
	4 - 8	100 - 200	2	9.5	7 - 8
	6.8 - 8.8	170 - 250	2.4	11	8 - 9
	9 - 12	225 - 300	3.2	12.5	9 - 10



AC TIG	0.5 - 1.5	5 - 50	1	6.5	6 - 7
	1.5 - 2	50 - 80	1.6	8	6 - 7
	2 - 3	80 - 110	2	9.5	7 - 8
	3 - 4	110 - 150	2.4	11	8 - 10
	4 - 5	150 - 180	3.2	12.5	10 - 12
	5 - 6	180 - 240	4	16	12 - 16
	6 - 10	240 - 400	4.8	19	15 - 18

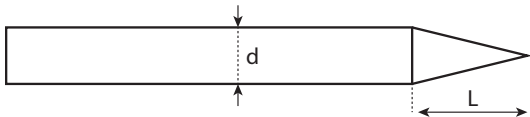
**TIG WELDING MODE (GTAW)**

**CONNECTIONS AND ADVICE**

- TIG welding requires gas shielding (argon).
- Connect the earth clamp to the positive (+) connector. Connect the torch's power cable to the negative (-) connection as well as to the torch and gas button(s) connections.
- Make sure that the torch is well fitted and that the consumables (vice grip, collar support, diffuser and nozzle) are not worn out.
- The choice of electrode depends on the TIG welding current.

**SHARPENING THE ELECTRODE**

For optimum performance, it is recommended to use an electrode sharpened in the following way:



L = 3 x d for a low current  
L = d for a strong current

**PROCESS SETTINGS**

Parameter settings	Settings	Welding processes				
		Synergy	DC	AC	Wizard	
-	Standard	-	✓	✓	-	Smooth current
	Pulsed	-	✓	✓	-	Pulsed current
	Fast Pulse		✓	-	-	Inaudible pulsed current
	Spot welding	-	✓	✓	-	Smooth tack welding
	Tack welding	-	✓	-	-	Pulsed tack welding
	Multi-Spot		✓	✓	-	Repeated smooth spot welding
	Multi-Tack		✓	-	-	Repeated pulsed tack welding
	AC Mix			-	✓	AC/DC current mixing
Material type	Fe, Al, etc.	✓	-	-	-	Choosing the material to be welded
Tungsten electrode diameter	1 - 4 mm	✓	✓	✓	✓	Choosing the electrode's diameter Allows HF ignition currents and synergies to be refined.
Ignition type	Lift, HF and Touch. HF	✓	✓	✓	✓	Choosing the ignition type
Trigger mode	2T, 4T and 4T LOG	✓	✓	✓	2T, 4T	Choosing the trigger welding management mode
E-TIG	OFF - ON	✓	✓	✓	-	Constant energy welding mode with arc length correction
Energy	Hold Thermal coefficient	-	✓	✓	✓	See «Energy» chapter on the following pages.
Parameter settings (advanced)		✓	✓	✓	✓	HF ignition adjustment

Accessing certain welding parameters is dependent on the selected display mode: Settings/Display mode: Easy, Expert or Advanced. Refer to the HMI manual.

**WELDING PROCESSES**

**• Synergy TIG**

No longer based on the chosen DC current or the welding cycle's parameter settings but, instead, incorporates welding rules/synergies based on experience. As a result, this mode restricts the number of settings to three basic ones: Material type, welding thickness and welding position.

**• TIG DC**

Suitable for welding ferrous metals such as steel and stainless steel as well as copper, its alloys and titanium.

• **AC TIG**



Suitable for welding aluminium, its alloys and copper.

• **TIG Wizard**

**Wizard Lab:**

see «Wizard Lab» chapter on the subsequent pages.

**Aluminum Wizard, Stainless Steel Wizard, Steel Wizard, Copper Wizard:**

This mode is used for pre-assembling  or welding  parts made of light alloys (AlSi, AlMg and Al99), stainless steel (CrNi), steel (Fe) and copper (CuZn and Cu). The relevant settings, in the form of pre-installed synergies, are the thickness of the parts to be welded and the joint type (butt welding (BW), fillet weld (FW), interior angle (BP), exterior angle or fusing wires together when butt welding). To switch from one mode to the other, press button n°4 on the keyboard (see HMI user manual).

**SETTINGS - DC TIG**

• **Standard**

This welding method enables high-quality welding on most ferrous materials such as steel, stainless steel, copper, its alloys and titanium. The various current and gas management options offer the user perfect control of the welding operation, from the very start of the welding process to the final cooling of the weld bead.

• **Pulsed**

This pulsed current welding mode combines strong current pulses (I, welding pulse) with weak current pulses (I\_Cold, cooling pulse). This pulsed mode allows parts to be assembled whilst limiting both the temperature rise and amount of distortion. Also ideal for in-position welding.

*Example:*

*The welding current (I) is set to 100 A and % (I\_Cold) is set to 50%, i.e. cold current = 50% x 100 A = 50 A.*

*F (Hz) is set to 10 Hz, the frequency of the pulse will be 1/10 Hz = 100 ms; this means that every 100 ms, there will be a pulse at 100 A, then another at 50 A will follow.*

• **FastPulse**

This very high-frequency, pulsed-current welding mode combines high current pulses (I, welding pulse) with low current pulses (I\_Cold, workpiece cooling pulse). FastPulse mode maintains the arc when using the high-frequency pulsed welding mode, however, it operates at frequencies that are less unpleasant, or even inaudible, to the welder.

• **Spot welding**

This spot welding mode allows parts to be pre-assembled before welding. Spot welding can be controlled manually using the trigger or by a predefined time delay. This spot welding time makes it easier to reproduce and produce non-oxidised spot welds.

• **Multi-Spot**

This is a spot welding mode similar to SPOT TIG but with defined spot welding and stopping times as long as the trigger is held down.

• **Tack welding**

The machine's tack welding mode can also be used to pre-assemble parts before welding but this time in two phases: the first phase of pulsed DC welding concentrates the arc for better penetration; this is followed by a second phase of standard DC welding, which widens the arc and therefore the weld pool to ensure the tack weld.

The times of the two tack welding phases are adjustable which makes it easier to reproduce and carry out non-oxidised tack welds.

• **Multi-Tack**

It is a pointing mode similar to TIG Tack, but with a sequence of pointing times and stop times defined as long as the trigger is pressed.

**SETTINGS - AC TIG**

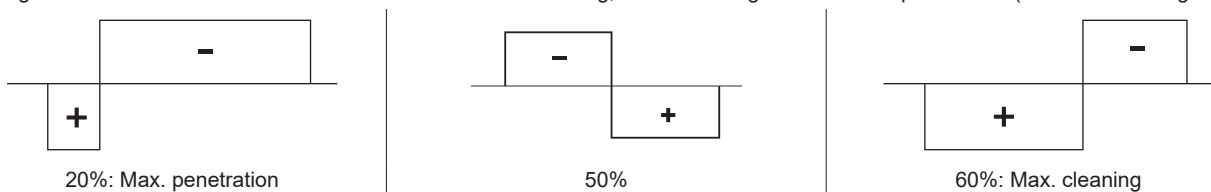
• **Standard**

This welding mode is dedicated to welding aluminium and its alloys (Al, AlSi, AlMg and AlMn). The alternating current allows the aluminium to be stripped clean, which is essential for welding properly.

**Balance (%T\_AC):**

During the positive wave, any oxidation is removed. During the negative wave, the electrode cools down and the parts are welded together, this is called penetration.

By changing the ratio between the two alternations via the balance setting, either cleaning is favoured or penetration (the default setting is 30%).



**• Pulsed**

This pulsed current welding mode combines strong current pulses (I, welding pulse) with weak current pulses (I\_Cold, cooling pulse). This pulsed mode allows parts to be assembled whilst limiting both the temperature rise and amount of distortion. Also ideal for in-position welding.

*Example:*

*The welding current (I) is set to 100 A and % (I\_Cold) is set to 50%, i.e. cold current = 50% x 100 A = 50 A.*

*F (Hz) is set to 10 Hz, the frequency of the pulse will be 1/10 Hz = 100 ms; this means that every 100 ms, there will be a pulse at 100 A, then another at 50 A will follow.*

**• SPOT WELDING**

This spot welding mode allows parts to be pre-assembled before welding. Spot welding can be controlled manually using the trigger or by a predefined time delay. This spot welding time makes it easier to reproduce and produce non-oxidised spot welds.

**• Multi-Spot**

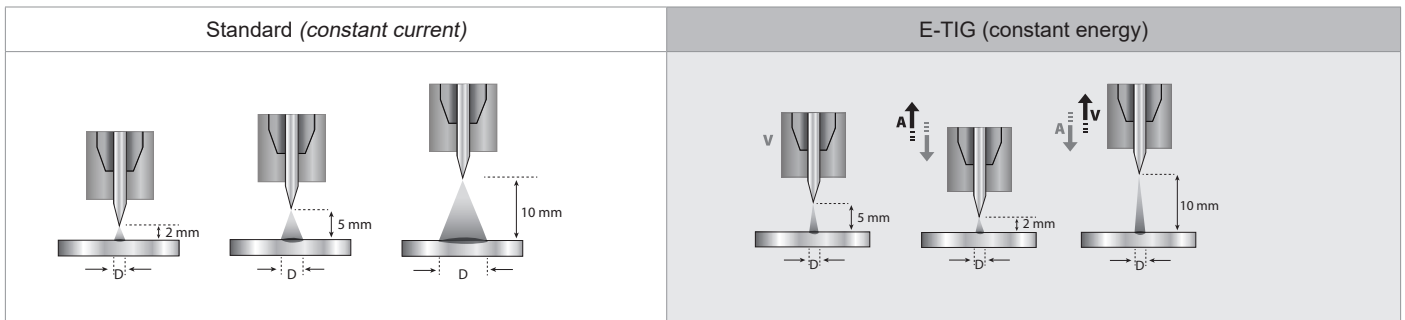
This is a spot welding mode similar to SPOT TIG but with defined spot welding and stopping times as long as the trigger is held down.

**• AC Mixed**

This AC welding method is used to weld aluminium and its thick alloys. It mixes DC sequences during AC welding processes which increases the energy delivered to the workpiece. The ultimate goal is to accelerate the work flow rate and, therefore, subsequent productivity when assembling aluminium. This mode cleans the workpiece less, so it is important to work on clean sheet metal.

**E-TIG**

This mode allows welding with a constant power supply by measuring the arc length variations in real time to ensure a weld bead with consistent width and penetration. In cases where the assembly process requires the welding energy to be controlled, E-TIG mode guarantees that the welder will respect the welding power regardless of the torch's position in relation to the workpiece.

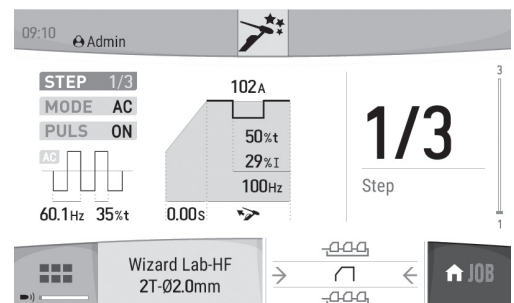
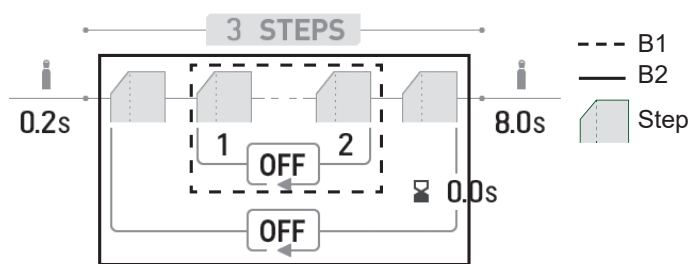


**Wizard Lab**

This welding mode allows complex (non-standard) welding cycles to be carried out with a series of steps. Each step is characterised by a current ramp, a step and a particular current type (DC, AC or pulsed).

Wizard Lab is configured in three stages:

- welding cycle sequence (number of steps, repetition loops, etc.)
- each step's parameter settings (ramp and current type, etc.)
- specific, advanced parameter settings



STEP: each step can be customised by changing the current type (DC or AC), the current form (standard or pulsed) as well as the ramp up to the set welding current (see «Setting a STEP» section). Each step can be fully customised.

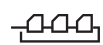
Welding cycle: a welding cycle consists of a Pre-Gas stage, one or more welding steps (see «Welding Cycle Definition» section) and a Post-Gas stage.

Loops: there are two different loops (see «Definition of the welding cycle» section):

- The welding cycle's inner loop (B1). Within the cycle, the user can choose to make one or more loops (repeating two or more of the welding steps); the user can even carry out infinite loops depending on the application, for example, AC MIX welding, which repeats two DC and AC steps.
- Cycle loops (B2). The user can choose to repeat the cycle (excluding the Pre-Gas and Post-Gas phases) once or several times (or even infinitely). They can also adjust the delay period between two repeated welding steps if necessary (e.g. MULTITACK welding, which repeats the TACK welding cycle with a delay period between two points as long as the trigger is held down).

EN

Defining the welding cycle:





	Unit	
Number of steps	-	The number of steps defines the welding cycle
Pre-Gas	s	Time for purging the torch and establishing the gas shielding before ignition
Number of loop steps	-	Repeat loops in the welding cycle (B1)
Input step	-	The repeat loop's starting step in the cycle (B1)
Output step	-	The repeat loop's ending step in the cycle (B1)
Number of loops of the cycle	-	Repeat loops in the entire welding cycle (B2)
Inter-loop time	s	The time between two repetitions of the whole welding cycle (B2)
Post Gas	s	Gas shielding duration after extinguishing the arc. It protects the part and the electrode against oxidation.

Setting up a STEP:



	Unit	
STEP	1/x	Selecting a STEP to be configured.
MODE	DC- DC+ AC	Selecting the step welding current type
PULSED	OFF ON	Pulses the set current
AC waveform	-	Waveform in AC.
Welding frequency	Hz	Polarity reversal welding frequency- cleaning
Cleaning percentage	%	Welding time dedicated to cleaning (%)
Current surge	s	Transition ramp between the previous step and the active step's current levels
Welding current	A	Welding current
Waveform	-	Pulsed part waveform
Cooling current	%	Second «cooling» welding current
Cooling time	%	The pulse's hot current (I) time balance
Pulse frequency	Hz	Pulse frequency
The step's time duration	min.	Step or trigger mode* welding-current duration

 \*In 2T mode, the step duration settings control allows the user to control for how long the configured step will go on when the trigger is released; the cycle will end between the chosen exiting step and the last one.

 \*The step time setting allows the user to switch from step-to-step by pressing and releasing button 2 in 4T mode or with a two-button torch.

Advanced settings, only available in «Advanced» display mode:

Advanced settings	Settings	Description
HF level	1 - 10	Index setting the voltage from 5 - 14 kV
HF duration	0.01 - 3 s	HF time before stopping
Breakdown voltage	OFF, 0 - 50 V	Higher arc voltage before stopping the welding machine
Time to breakdown	0 - 10 s	Duration of breakdown voltage
Bonding voltage	OFF, 0 - 50 V	Lower arc voltage before stopping the welding power source (Anti-Stick)
Delay before bonding	0 - 10 s	Duration of breakdown voltage

**CHOOSING THE ELECTRODE'S DIAMETER**

Electrode Ø (mm)	DC TIG		AC TIG	
	Pure tungsten	Tungsten with oxides	Pure tungsten	Tungsten with oxides
1	10 > 75	10 > 75	15 > 55 A	10 > 70 A
1.6	60 > 150	60 > 150	45 > 90 A	60 > 125 A
2	75 > 180	100 > 200	65 > 125 A	85 > 160 A
2.5	130 > 230	170 > 250	80 > 140 A	120 > 210 A

3.2	160 > 310	225 > 330	150 > 190 A	150 > 250 A
4	275 > 450	350 > 480	180 > 260 A	240 > 350 A
Approximately = 80 A per Ø mm			Approximately = 60 A per Ø mm	

**CHOOSING THE IGNITION TYPE**

Lift: Arc-Lift ignition (for HF-sensitive environments).

HF: non-contact, high-frequency ignition system for tungsten electrodes.

Touch HF: Delayed, high-frequency ignition after the tungsten electrode has made contact with the workpiece.

**Lift**

- 1.) Position the torch's nozzle and the electrode tip on the workpiece and activate the torch's button.
- 2.) Tilt the torch until a gap of about 2 - 3 mm separates the electrode's tip from the workpiece. The arc will start.
- 3.) Return the torch to its normal position to start the welding cycle.

**HF**

- 1.) Place the torch in the welding position above the workpiece (with a distance of about 2 - 3 mm between the electrode's tip and the workpiece).
- 2.) Press the torch's button (the arc will ignite without contact using high voltage [HF] ignition pulses).
- 3.) The initial welding current circulates, the welding continues according to the welding cycle.

**Touch HF**

- 1.) Position the electrode's tip on the workpiece and press the torch button.
- 2.) Lift the electrode from the workpiece.
- 3.) After a delay of 0.2 s, the arc will ignite without contact using high voltage (HF) ignition pulses; the initial welding current will flow and the welding will continue according to the welding cycle.

Advanced settings, only available in «Advanced» display mode:

Advanced settings	Settings	Description
HF duration	0.01 - 3 s	HF time before stopping
HF level	0 - 10	Index setting the voltage from 5 - 14 kV

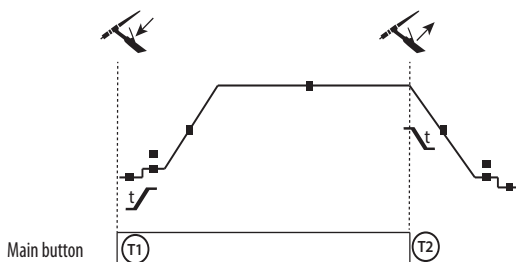
**COMPATIBLE TORCHES AND TRIGGER ACTIONS**

<p>Single trigger</p>	<p>Double button</p>	<p>Double button &amp; potentiometer</p>	<p>Up &amp; down</p>
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For the one-button torch, the button is called the «main button».

On the two-button torch, the first button is called the «main button» and the second is called the «secondary button».

• 2T

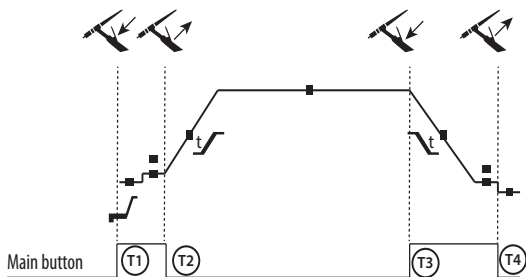


T1 - The main button is pressed, the welding cycle starts (Pre Gas, I\_Start, UpSlope and welding).

T2 - The main button is released, the welding cycle is stopped (DownSlope, I\_Stop, Post Gas).

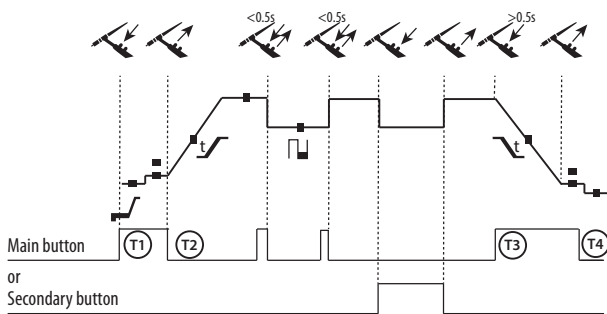
When the double-button torch is in 2T mode, the secondary button is operated in the same way as the main button.

• 4T



T1 - The main button is pressed, the cycle starts from the Pre Gas and stops in the I\_Start phase.  
 T2 - The main button is released, the cycle continues to UpSlope and welding processes.  
 T3 - The main button is pressed, the cycle goes into DownSlope and stops in the I\_Stop phase.  
 T4 - The main button is released, the cycle ends with Post Gas.  
 NB: for torches, double-button torches and double-button torches with a potentiometer  
 => «high/welding current» button and active potentiometer, «low» button inactive.

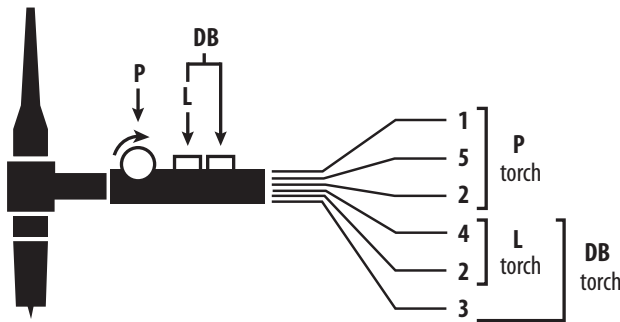
• 4T LOG



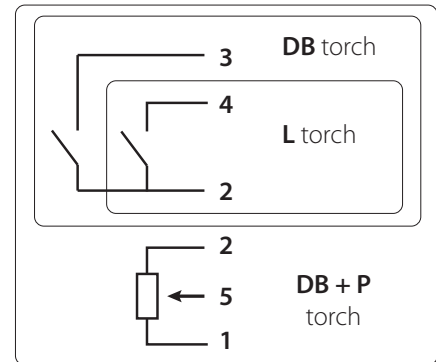
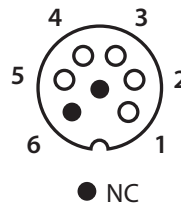
T1 - The main button is pressed, the cycle starts from the Pre Gas and stops in the I\_Start phase.  
 T2 - The main button is released, the cycle continues in UpSlope and welding.  
 LOG: This operating mode is used in the welding phase:  
 - A brief push of the main button (< 0.5 s) switches the current from I\_Welding to I\_Cold and vice versa.  
 - When the secondary button is held down, the current switches from I\_Welding to I\_Cold.  
 - When the secondary button is held down, the current switches from I\_Cold to I\_Welding.  
 T3 - Holding down the main button (> 0.5 s) makes the cycle go into DownSlope and then stop in the I\_Stop phase.  
 T4 - The main button is released, the cycle ends with Post Gas.

For double-button or double trigger torches with a potentiometer, the «upper» trigger carried out the same function as the single-trigger torch. The «lower» trigger switches the machine to a cold current when it is held down. The torch's potentiometer, when present, allows the user to adjust the welding current from 50 - 100% of the displayed value. The «Up & Down» feature allows the current to be adjusted at the torch.

TRIGGER-CONTROL CONNECTION

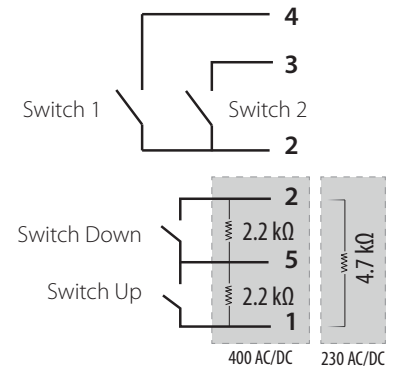
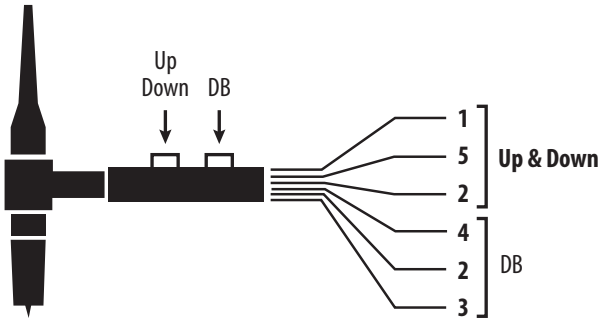


SRL18 torch wiring diagram



Electrical diagram according to the type of torch

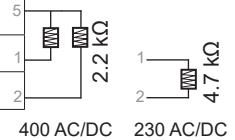
Torch types		Wire type	Associated connector pin
Double-button torch with potentiometer	Double-button torch	Common/Mass	Two
		Button 1	Four
		Button 2	Three
	Trigger torch	Potentiometer common/ground	Two
		10 V	One
		Cursor	Five



Up & Down torch wiring diagram

Up & Down torch electrical diagram

Torch type	Wire type	Associated connector pin
Up & Down Torch	Common Switch 1 & 2	2
	Switch 1	4
	Switch 2	3
	Common Up & Down Switch	5
	Up Switch	1
	Down Switch	2



**MANUAL GAS PURGE**

Oxygen in the torch can lead to decreased mechanical performance and may result in a decreased corrosion-resistance level. To purge the gas from the torch, press and hold push-button n°1 (see HMI user manual) and follow the on-screen procedure.

**CHOOSING THE SETTINGS**

	Unit	
Pre-Gas	s	Time for purging the torch and establishing the gas shielding before ignition
Current (starting)	%	This start-up current is a warm-up phase before the current ramp-up.
Time (starting)	s	Dwell time at start-up before ramping up
Current surge	s	Allows a gradual increase in welding current
Welding current	A	Welding current
Fade out	s	Avoids cratering at the end of welding process as well as the risk of cracking, particularly in light alloys.
Stopping current	%	This stopping current is the phase after the current ramp down.
Stopping time	s	Stopping time is a phase after the down ramp in running
Thickness	mm	Thickness of the workpiece to be welded
Position	-	Welding position
Post gas	s	Gas shielding duration after extinguishing the arc. It protects the part and the electrode against oxidation when cooling.
Waveform	-	Pulsed part waveform
AC waveform	-	Alternating current (AC) waveform
Cooling current	%	Second «cooling» welding current
Cooling time	%	The pulse's hot current (I) time balance.
Frequency (of pulses)	Hz	Pulse frequency between the welding current and the cold current: PARAMETER SETTING TIPS: • If welding with a manual filler metal, then F (Hz) is synchronised to the filler metal application movement. • If the sheet metal is thin without a filler metal (< 0.8 mm), F (Hz) > 10 Hz. • When welding in position, then F (Hz) < 100 Hz



Spot welding	s	Manual or a defined duration
Pulse duration	s	Manual or time-dependent pulse phase
Non-pulsed duration	s	Manual or time-dependent smooth current phase
Welding frequency	%	Polarity reversal welding frequency- cleaning
Percentage of cleaning	%	Welding time dedicated to cleaning (30-35% by default)
AC Time	s	Duration of AC TIG welding
DC Time	s	Duration of DC TIG welding
Duration between two points	s	The time between the end of a weld (excluding Post Gas) and the start of a new weld (including Pre Gas).

Access to some welding parameter settings depends on the welding process used (synergy, AC or DC, etc.) and the selected display mode (Easy, Expert or Advanced). Refer to the HMI manual.

## MMA (SMAW) WELDING MODE

### CONNECTIONS AND ADVICE

- Connect the cables, electrode holder and earth clamp to the socket connections.
- Respect the polarities and observe the welding currents indicated on the electrode's box.
- Remove coated electrodes from the electrode holder when the welding power source is not in use.
- This device is equipped with three Inverter-specific features:
  - Hot Start provides an overcurrent at the beginning of the welding process.
  - Arc Force delivers an overcurrent that prevents the electrode from sticking to the workpiece when the electrode enters the weld pool.
  - The Anti-Stick feature means the electrode can be easily detached without allowing it to turn red if it becomes stuck.

### PROCESS SETTINGS

Parameter settings	Settings	Welding processes			
		Standard	Pulsed	AC	
Electrode type	Rutile Basic Cellulosic	✓	✓	✓	The type of electrode determines specific parameters depending on the type of electrode used; this is in order to optimise its weldability.
Anti-Stick	OFF - ON	✓	✓	✓	The Anti-Stick feature is recommended for safely removing an electrode, it prevents it from sticking to the workpiece (the current is automatically cut off).
Polarity	Direct (+++ and ---) Inverted (+- and -++)	✓	✓	-	The product's accessories are changed in the event of a direct or reverse polarity change.
Energy	Hold Thermal coefficient	✓	✓	✓	See «Energy» chapter on the following pages.

Accessing certain welding parameters is dependent on the selected display mode: Settings/Display mode: Easy, Expert or Advanced. Refer to the HMI manual.

### WELDING PROCESSES

#### • Standard

This welding mode is suitable for most applications. It can be used with all types of coated, rutile, basic and cellulosic electrodes and on all materials: steel, stainless steel and cast iron.

#### • Pulsed

This welding mode is suitable for applications in the vertical up position (PF). Pulsing keeps the weld pool cold while promoting material transfer. Without pulsing, vertical up welding requires a «Christmas tree» movement, i.e. a difficult, triangular movement. Thanks to MMA pulsed welding, this movement is no longer necessary; depending on the thickness of your workpiece, a straight up movement may suffice. However, if you wish to enlarge the weld pool, a simple sideways movement, similar to flat welding, is adequate. In this instance, you can set the pulse current frequency on the display screen. This method offers greater control of the vertical welding process.

#### • AC

This welding mode is used in very specific cases where the arc is not stable or straight, when it is subjected to magnetic blow-outs (magnetised parts or nearby magnetic fields, etc.). The alternating current leaves the welding arc unaffected by its electrical environment. It is necessary to check that your coated electrode can be used with an AC current.

### CHOOSING COATED ELECTRODES

- Rutile electrode: very easy to use in all welding positions.
- Basic electrode: used in all positions, suitable for safety work due to its increased mechanical properties.
- Cellulosic electrode: very dynamic arc with a high melting speed, its capacity for use in all positions makes it especially suitable for working on pipelines.

**CHOOSING THE SETTINGS**

	Unit	
Percentage Hot Start	%	Hot Start is a feature that delivers an overcurrent upon ignition to prevent the electrode from sticking to the workpiece. The voltage (% of welding current) and time (seconds) can both be set.
Hot Start duration	s	
Welding current	A	The welding current is set according to the selected electrode's diameter and type (refer to the electrode's packaging).
Cooling current	%	Second «cold» welding current.
Arc Force	%	Arc Force is an overcurrent delivered to prevent the electrode or molten metal from sticking it touches the weld pool.
AC waveform	%	Waveform in AC. A trapezoid (or Christmas tree) motion is recommended.
Welding frequency	Hz	Polarity reversal welding frequency + or -
Pulse frequency	Hz	Pulse mode pulse frequency.

Accessing certain welding parameters is dependent on the selected display mode: Settings/Display mode: Easy, Expert or Advanced. Refer to the HMI manual.

**ADJUSTING THE WELDING CURRENT**

The following settings correspond to the available current range depending on the type and diameter of the electrode. These ranges are quite wide as they depend on the application as well as the welding position.

Electrode ø (mm)	Rutile E6013 (A)	Basic E7018 (A)	Cellulosic E6010 (A)
1.6	30 - 60	30 - 55	-
2.0	50 - 70	50 - 80	-
2.5	60 - 100	80 - 110	60 - 75
3.15	80 - 150	90 - 140	85 - 90
4.0	100 - 200	125 - 210	120 - 160
5	150 -290	200 - 260	110 - 170
6.3	200 - 385	220 - 340	-

**ADJUSTING ARC FORCE**

It is advisable to set the Arc Force to the middle position (0) when starting to weld and to adjust it according to the welding results and the user's preferences. Note: the Arc Force setting range is determined by the type of electrode selected.

**HOT START SETTINGS**

It is advisable to set the Hot Start feature low for thin sheet metal and to set it high for thicker and more difficult sheet metal (dirty or oxidised parts).

**ENERGY**

In addition to the weld bead's energy reading after welding, this mode, developed for welding with DMOS-supported energy control, allows the user to change the following settings:

- The thermal coefficient according to the standard used: 1 for ASME standards and 0.6 (TIG) or 0.8 (MMA) for European standards. The displayed energy is calculated taking into account this coefficient.
- The weld bead's length (OFF - mm): If a length is recorded, then the energy display is no longer in joules, but in joules/mm (the unit in the display «J» will flash).

**SAVING AND RECALLING JOBS**

Accessible through the «JOB» icon on the main screen.

The active settings are automatically saved and recalled the next time you turn on the machine.

In addition to the active settings, it is possible to save and recall «JOB» configurations.

There are 500 JOBS for TIG welding processes and 200 for MMA welding processes. Memory storage is based on the current process settings, the active settings and the user profile.

**JOB mode**

JOB mode allows you to create, save, recall and delete JOBs.

**Quick Load** - Recall JOBs from the trigger when not welding.

Quick Load is a non-welding JOB recall mode (20 JOBs max.) and is only available for TIG processes.

From a list of previously created JOBs, JOB recalls are done by short trigger presses. All trigger modes and welding modes are supported.

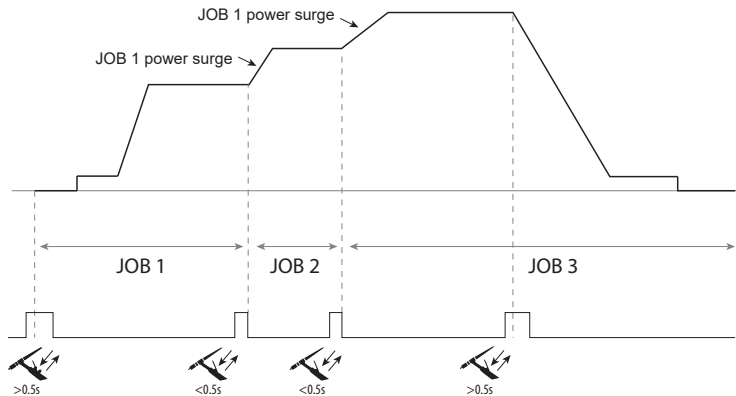
**MultiJob** - Recall JOBS using the trigger when welding.

From a MultiJOB list made up of previously created JOBS, this linking mode makes it possible to weld up to 20 JOBS in sequence with no interruption.

When the mode is activated, JOB N°1 in the list will be loaded and displayed. The trigger mode is forced to 4T.

During welding, this mode allows the JOBS in the uploaded list to be linked together by carrying out short presses on the torch's buttons.

The welding process is stopped by holding down the torch's buttons or, when the welding cycle is finished, JOB N°1 is reloaded for a future welding sequence.



When the mode is activated, JOB N°1 in the list will be loaded and displayed.

The JOBS recall sequence is looped: when the last JOB on the list is reached, the next one will be JOB N°1.

Activate the welding process by holding down the torch's buttons.

**C5**

From a previously created C5 list of 5 JOBS, this simple automation mode from the Remote Control connector allows the user to recall JOBS via a PLC (see note on the website - [https://planet.gys.fr/pdf/spdoc/fr/CONNECT\\_5.pdf](https://planet.gys.fr/pdf/spdoc/fr/CONNECT_5.pdf)).

**OPTIONAL REMOTE CONTROL**

- Analogue remote control RC-HA2 (P.N. 047679):

An analogue remote control can be connected to the power source via the connection (I-11).

This remote control allows the current to be adjusted between 50 - 100% of the set current. In this configuration, all of the power source's modes and features can be accessed and configured.

- Remote control RC-FA1 pedal (P.N. 045682):

A remote-control pedal can be connected to the power source via the connection (I-11).

The pedal allows you to adjust the current from the minimum to 100% of the set welding current. In TIG mode, the power source will only work in 2T mode. Furthermore, the current's rise and fall are no longer managed by the power source (inactive functions) but by the user using the foot pedal.

- Remote HMI - RC-HD2 digital remote control (P.N. 062122):

400 AC/DC: A digital remote control can be connected to the power source via the connection (I-12).

230 AC/DC FV: A digital remote control can be connected to the power source via the optional NUM-1 kit (I-7).

This remote control is designed for MMA and TIG welding processes. It allows the user to remotely adjust the welding unit. An ON/OFF button is used to switch on or off the digital remote control. When the digital remote control is switched on, the power source's HMI will display the current and voltage values. As soon as the HMI is turned off or disconnected, the welding machine's HMI is reactivated.

**Terminals**

This product is equipped with a female remote control terminal.

The purposely designed, seven-prong, male connector (optional extra, PN: 045699) allows different types of remote control to be connected. For wiring, follow the diagram below.

REMOTE CONTROL TYPE		Wire type	Associated connector pin
C5	Foot pedal	10 V	A
		Cursor	B
	Manual remote control	Common / Earth	C
		Switch	D
		AUTO-DETECT	E
		ARC ON	F
		REG I	G

External view

**OPTIONAL COOLING UNIT**

Compatibility	Part number	Name	Cooling power	Capacity	Power-supply voltage
TITANIUM 230 AC/DC FV	070820	KOOLWELD 1	1,000 W	3 L	24 V
TITANIUM 400 AC/DC	013537	WCU 1KW C		5.5 L	400 V +/- 15%

The machine will automatically detect the cooling unit. To deactivate the cooling unit (OFF), please refer to the HMI's user manual.

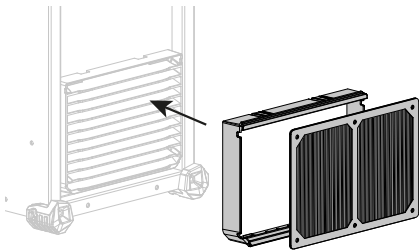
The following safeguarding measures are supported by the cooling unit to ensure that the torch and user are protected:

- Minimum coolant level
- Minimum coolant flow rate through the torch
- Thermally protected coolant



Ensure that the cooling unit is switched off before disconnecting the torch's fluid inlet and outlet hoses. Coolant is harmful and can irritate the eyes, mucous membranes and skin. Hot liquids can cause burns.

**OPTIONAL FILTER KIT**



Dust filter (P.N 046580) with fine filtration: 630 µm (0.63 mm). Please note that using this filter reduces the welding machine's duty cycle.

The dust filter should be cleaned regularly to avoid the risk of overheating due to blocked air vents. Unclip and clean with compressed air.

**ADDING FEATURES**

The manufacturer, GYS, offers a wide range of compatible products for your welding equipment. To discover them, scan the QR code.

**WARRANTY CONDITIONS**

The warranty covers any defects or manufacturing faults for two years from the date of purchase (parts and labour)

The warranty does not cover:

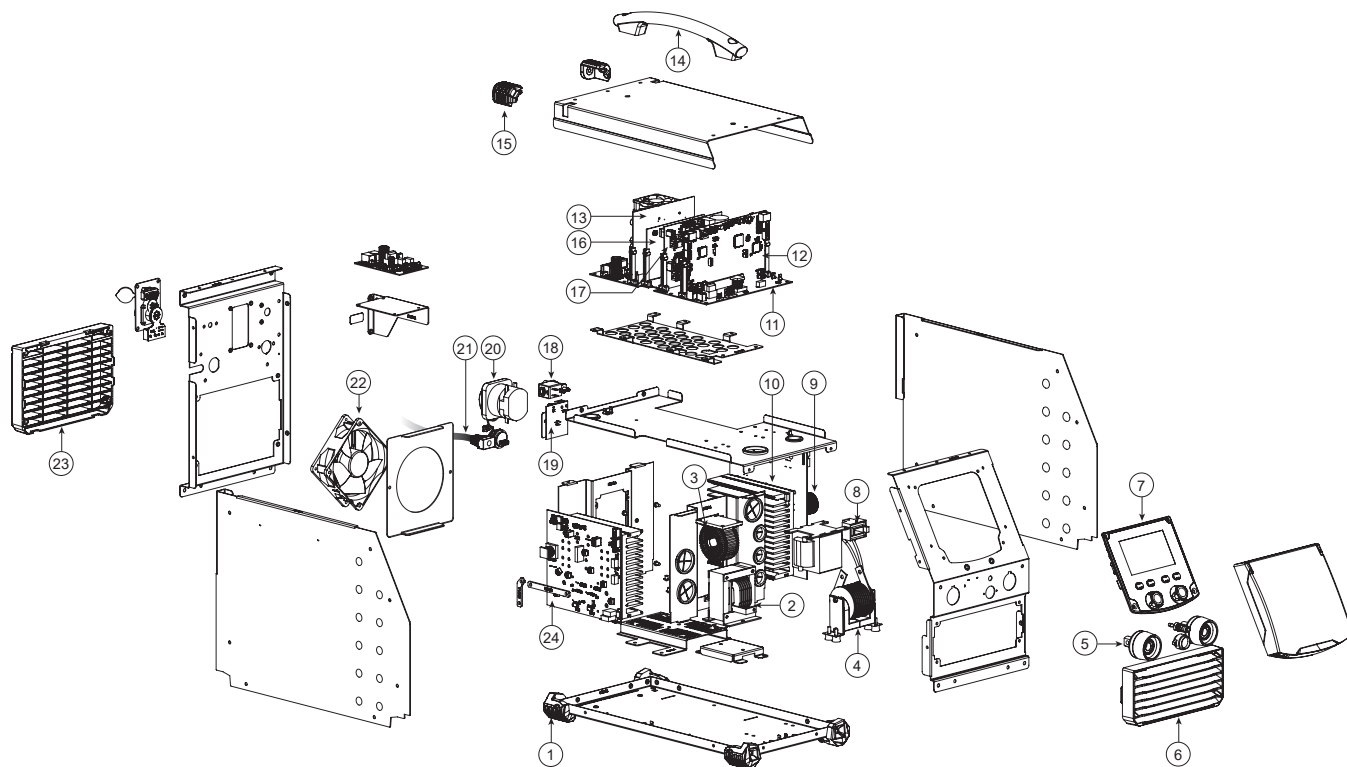
- Any other damage caused by transport
- The parts' normal wear and tear (e.g . cables and clamps, etc.).
- Misuse-related incidents (misfeeding, dropping or disassembling the device)
- Environmental failures (pollution, rust and dust, etc.)

Should the appliance malfunction, return it to your distributor together with:

- dated proof of purchase (receipt or invoice, etc.)
- a note explaining the breakdown

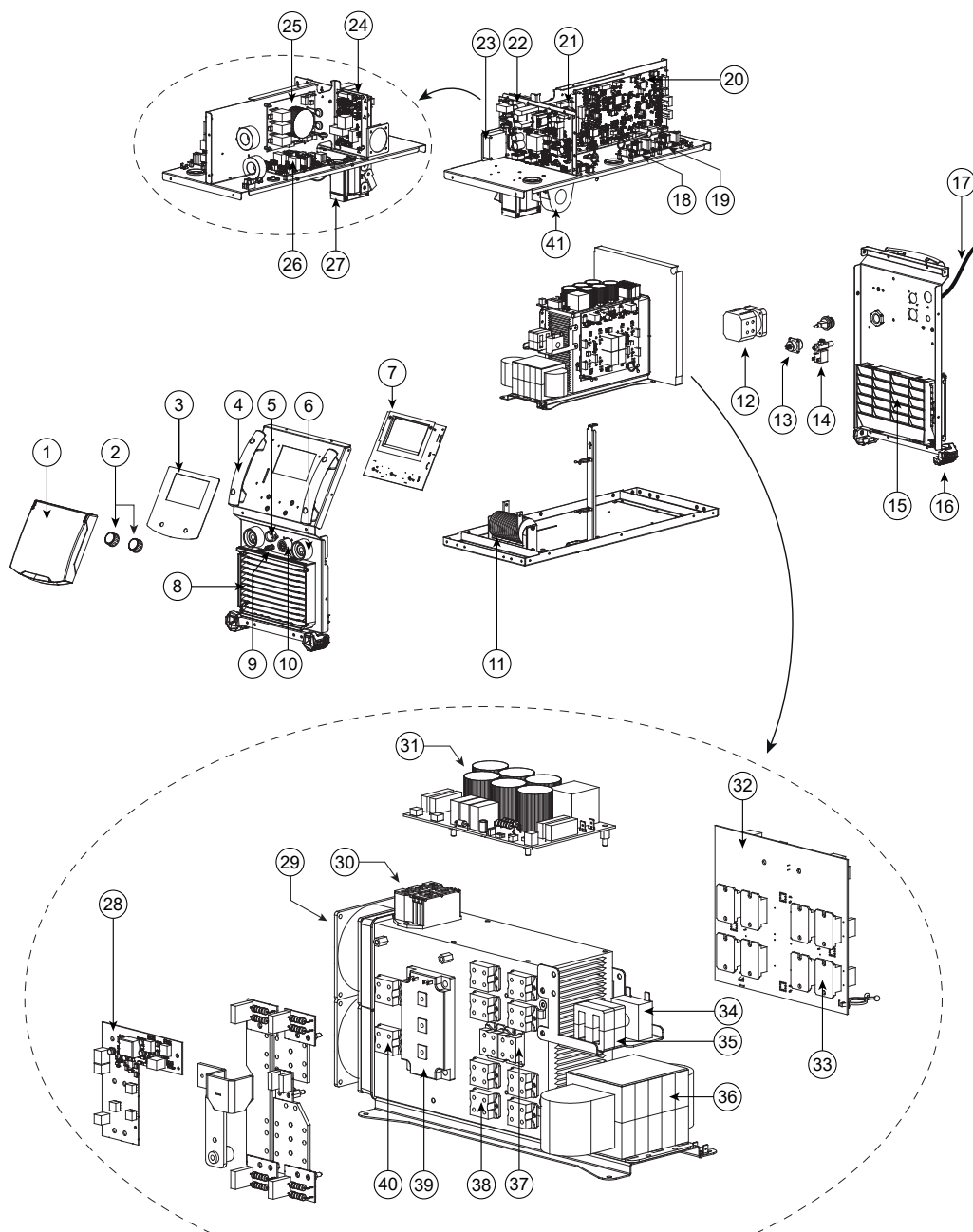
**SPARE PARTS / ERSATZTEILE / PIEZAS DE REPUESTO / ЗАПАСНЫЕ ЧАСТИ / RESERVE  
ONDERDELEN / PEZZI DI RICAMBIO**

TITANIUM 230 AC/DC FV



1	Patin caoutchouc inférieur / Bottom rubber pad	56120
2	Self DC / Self DC	63707
3	Self PFC / Self PFC	64673
4	Transformateur HF / HF transformer	63698
5	Embase texas femelle / Female dinse socket	51528
6	Grille avant / Front grill	56286
7	Circuit IHM / HMI circuit	E0092C
8	Capteur de courant 300A / 300A current sensor	64452
9	Transformateur de puissance / Power Transformer	64653
10	Circuit primaire / Primary circuit	E0094C
11	Circuit fond de panier / Backplane circuit	E0096C
12	Circuit de contrôle / Control circuit	E0093C
13	Circuit d'alimentation 24 V / 24 V power supply circuit	E0098C
14	Poignée / Handle	56048
15	Patin caoutchouc supérieur / Top rubber pad	56163
16	Circuit HF / HF circuit	E0099C
17	Circuit CAIP / CAIP circuit	E0097C
18	Electrovanne / Solenoid valve	70991
19	Carte alimentation groupe froid / Cooling unit power supply card	E0111C
20	Interrupteur biphasé / Two-phase switch	51230
21	Cordon secteur / Power cord	21480IND2
22	Ventilateur / Fan	51290
23	Grille ventilateur / Fan grill	56094
24	Circuit secondaire / Secondary circuit	E0095C

TITANIUM 400 AC/DC



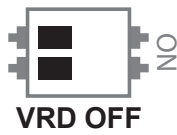
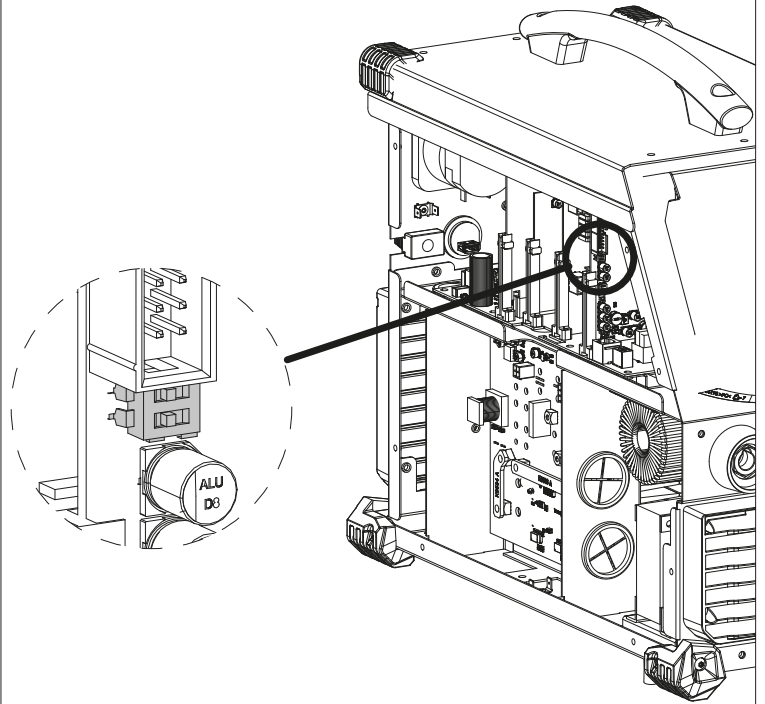
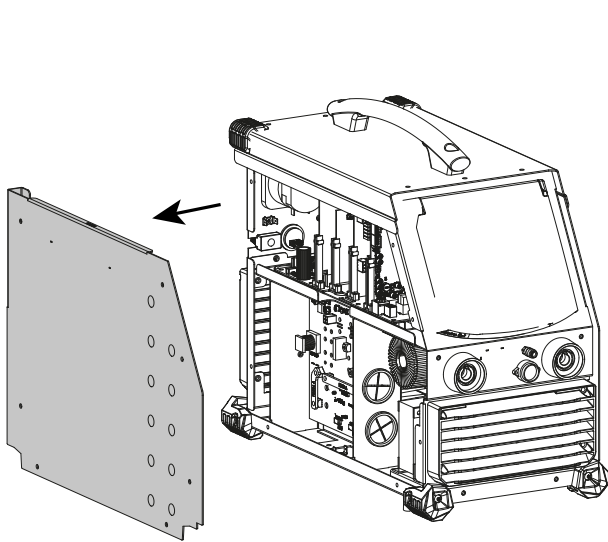
1	Carter plastique / Plastic Crankcase / Carcasa de plástico	56199	
2	Bouton noir 28 mm / Black button 28 mm / Botón negro 28 mm	73016	
3	Clavier / Keypad / Bedienfeld / Teclado	51973	
4	Poignée / Handle / Handgriff / Mango	56047	
5	Faisceau Torche / Torch connection cable / Brenner-Schlauchpaket / Cable conexión Antorcha	91847	
6	Embase Texas OF 95.24 HF Femelle / DINs plate OF 95.24 Female / Texas-Anschlussbuchse OF 95.24 HF / Conector Texas OF 95.24 HF Hembra	51502	
7	Circuit IHM / MMI circuit / Displayplatine / Tarjeta Interfaz	Si fabrication avant 07/2021 If manufactured before 07/2021	97746C
		Si fabrication après 07/2021 If manufactured after 07/2021	97712C
		Si fabrication pendant 07/2021 If manufactured during 07/2021	S.A.V
8	Grille de protection extérieure / External protection grill / Äußeres Schutzgitter / Rejilla de protección exterior	56094	
9	Coupleur gaz BSP20 / Gas coupler BSP20 / Schutzgaskupplung BSP20 / Acople gas BSP20	55090	

10	Faisceau connectique dévidoir ou IHM déportée / Wire feeder connector or MMI remote interface / Kabel Anschluss Drahtvorschub oder externes Bedienfeld / Cable conexión devanadera o IHM a distancia	96000
11	Transformateur HF / HF transformer / Trafo HF / Transformador HF	63716
12	Commutateur triphasé / Three phase switch / Dreiphasiger Schalter / Conmutador trifásico	51061
13	Faisceau CAD / CAD connection cable / CAD Kabelbaum / Cable CAD	71483
14	Electrovanne / Solenoid valve / Schutzgasmagnetventil / Electroválvula	70991
15	Grille de protection intérieure / Internal protection grill / Inneres Schutzgitter / Rejilla de protección interior	56095
16	Patin / Pad / Gummifuß / Soporte	56120
17	Cordon secteur 3P+Terre 4mm <sup>2</sup> / Power supply cable 3P + Earth 4 mm <sup>2</sup> / Netzkabel 3 ph. + Schutzleiter 4mm <sup>2</sup> / Cable de red eléctrica 3P + Tierra 4mm <sup>2</sup>	21470
18	Circuit filtrage bouton / Filter circuit button / Taste Filter Kreislauf / Circuito de filtrado Botón	97462C
19	Circuit filtrage CAD / Filter circuit CAD / gefilterter Stromkreis CAD / Circuito de filtrado CAD	97463C
20	Circuit de contrôle / Control circuit / Steuerkreis / Circuito de control	97724C
21	Circuit d'alimentation auxiliaire n°2 / Auxiliary supply circuit n°2 / Hilfsversorgungsschaltung Nr.2 / Circuito alimentación auxiliar n°2	97288C
22	Circuit d'alimentation auxiliaire n°1 / Auxiliary supply circuit n°1 / Hilfsversorgungsschaltung Nr.1 / Circuito alimentación auxiliar n°1	97289C
23	Ventilateur 24V (petit) / 24V fan (small) / Lüfter 24V (klein) / Ventilador 24V (pequeño)	51018
24	Circuit HF / HF circuit / HF-Platine / Circuito HF	E0062C
25	Circuit CEM / CEM circuit / EMV-Platine / Tarjeta CEM	97277C
26	Circuit CAIP / CAIP circuit / CAIP-Platine / Circuito CAIP	97741C
27	Self DC / Self DC / Self DC / Self DC	96121
28	Circuit Onduleur / Inverter circuit / Wechselrichterplatine / Circuito inversor	97742C
29	Ventilateur 24V / 24V fan / Lüfter 24V / Ventilador 24V	50999
30	Pont de diode de puissance / Power relay diode bridge / Leistungsdiodenbrücke / Puente de diodos de potencia	52196
31	Circuit Entrée puissance / Circuit power input / Leistungseingangsschaltung / Circuito de entrada de potencia	97278C
32	Circuit primaire de puissance / Primary power relay circuit / Primäre Leistungsplatine / Circuito primario de potencia	97274C
33	Transistor de puissance / Power relay transistor / Leistungstransistor / Transistor de potencia	52198
34	Transformateur de courant / Current transformer / Leistungstrafo / Transformador de corriente	64664
35	Self primaire / Self primary / Primärspule / Inductancia primaria	96119
36	Transformateur de puissance / Power transformer / Netztransformator / Transformador de potencia	64667
37	Résistance de puissance 5R / Power resistor 5R / Leistungsdiode 5R / Resistencia de potencia 5R	51424
38	Diode de puissance / Power relay diode / Leistungsdiode / Diodo de potencia	52197
39	Module IGBT / IGBT module / IGBT-Modul / Módulo IGBT	52199
40	Résistance de puissance 10R / Power resistance 10R / Leistungsdiode 10R / Resistencia de potencia 10R	52271
41	Capteur à effet hall / Hall effect sensor	64460



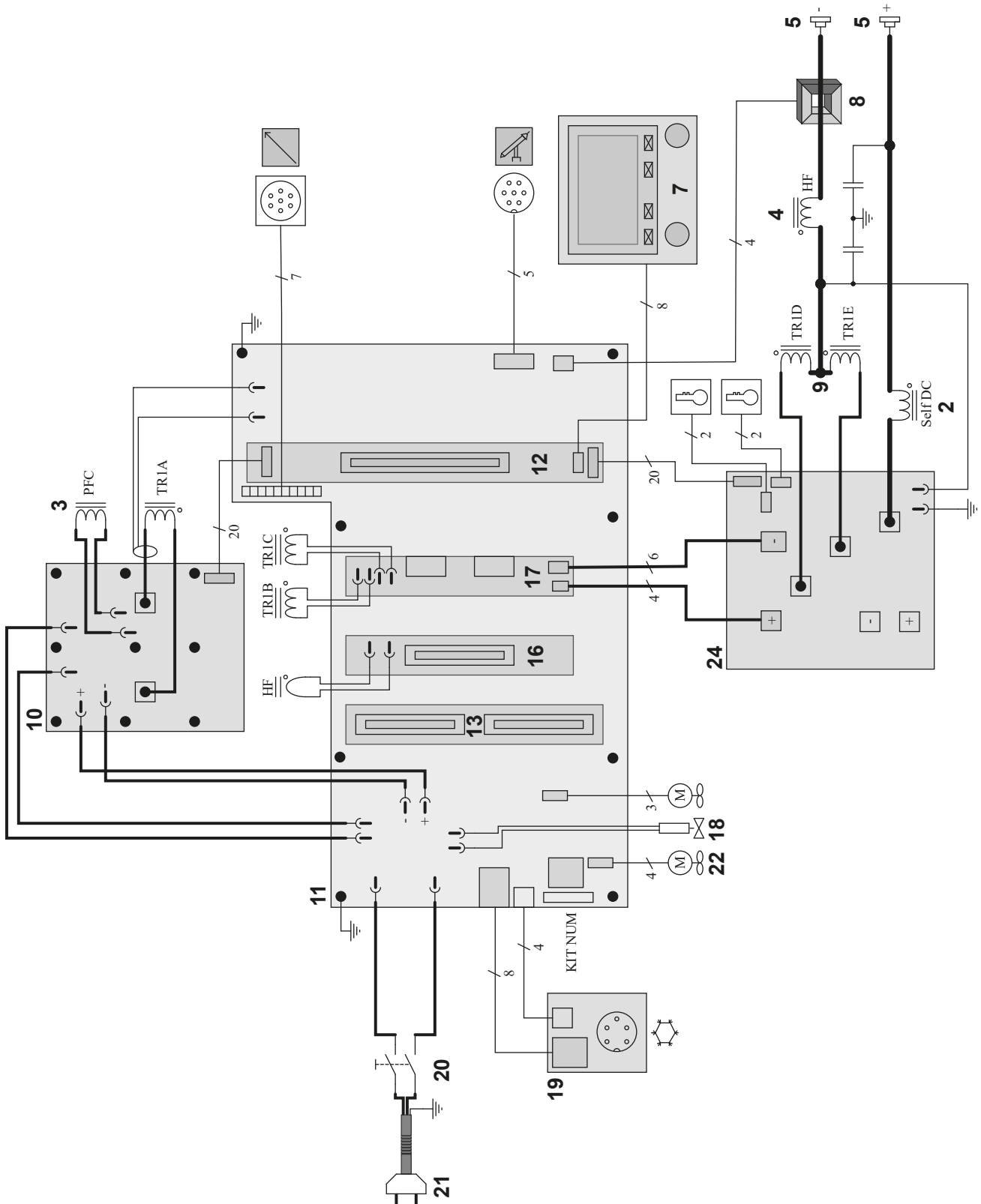
**INTERRUPTEUR VRD / VRD SWITCH / VRD-EIN-AUS-SCHALTER / INTERRUPTOR VRD / VRD SCHAKELAAR / INTERRUPTORE VRD**

TITANIUM 230 AC/DC FV

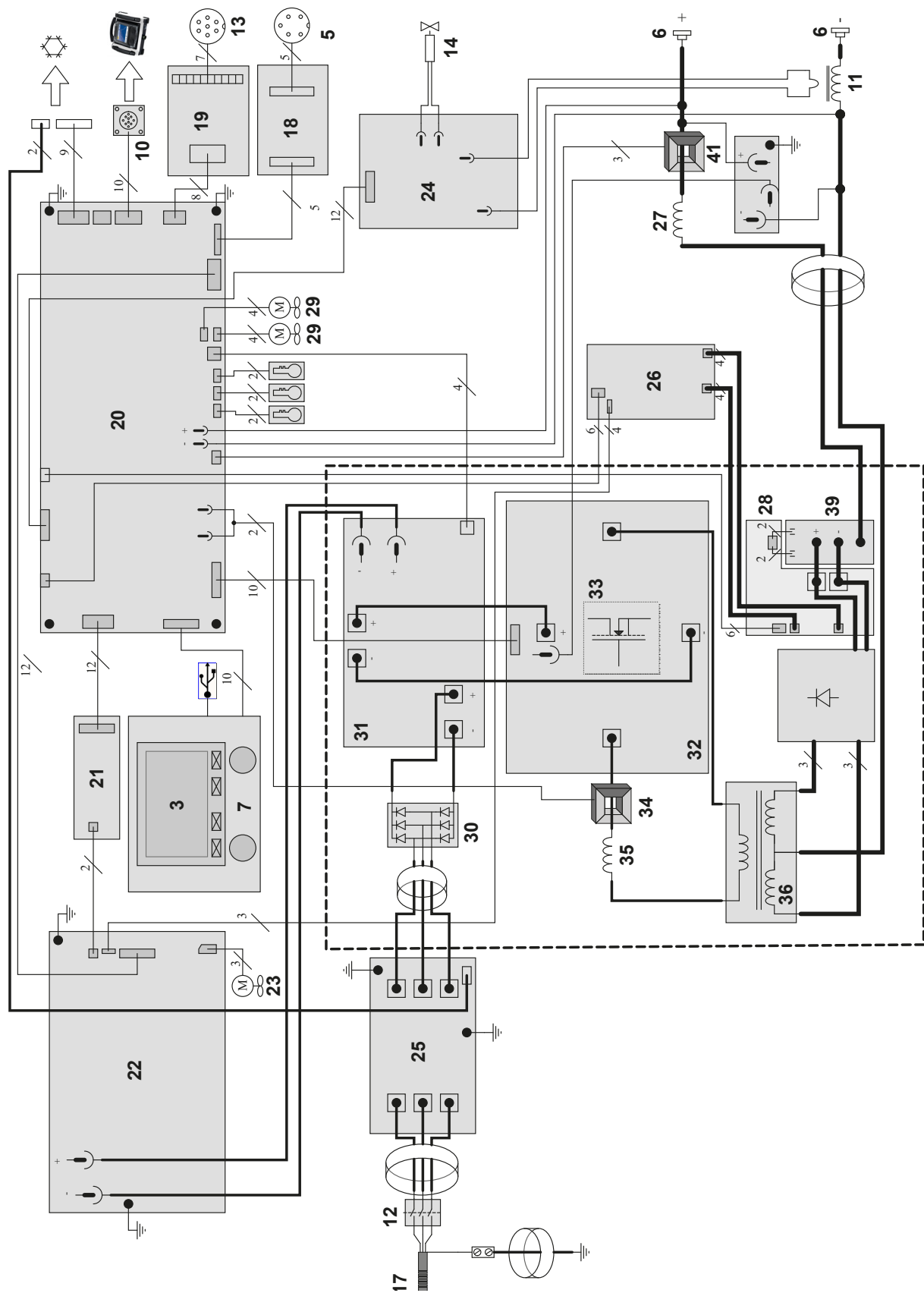


CIRCUIT DIAGRAM / SCHALTPLAN / DIAGRAMA ELECTRICO / ЭЛЕКТРИЧЕСКАЯ СХЕМА / ELEKTRISCHE SCHEMA / SCHEMA ELETTRICO

TITANIUM 230 AC/DC FV



TITANIUM 400 AC/DC



**TECHNICAL SPECIFICATIONS / TECHNISCHE DATEN / ESPECIFICACIONES TÉCNICAS / ТЕХНИЧЕСКИЕ СПЕЦИФИКАЦИИ / TECHNISCHE GEGEVENS / SPECIFICHE TECNICHE**

		TITANIUM 230 AC/DC FV					
Primaire / Primary / Primär / Primario / Первичка / Primaire / Primario							
Tension d'alimentation / Power supply voltage / Versorgungsspannung / Tensión de red eléctrica / Напряжение питания / Voedingsspanning / Tensione di alimentazione	U1	110 V +/- 15%			230 V +/- 15%		
Fréquence secteur / Mains frequency / Netzfrequenz / Frecuencia / Частота сети / Frequentie sector / Frequenza settore		50 / 60 Hz					
Nombre de phases / Number of phases / Anzahl der Phasen / Número de fases / Количество фаз / Aantal fasen / Numero di fase		1					
Fusible disjoncteur / Fuse / Sicherung / Fusibile disyuntor / Плавкий предохранитель прерывателя / Zekering hoofdschakelaar / Fusibile disgiuntore		32 A			16 A		
Courant d'alimentation effectif maximal / Maximum effective supply current / Corriente de alimentación efectiva máxima / Maximale effectieve voedingsstroom / Corrente di alimentazione effettiva massima / Maksymalny efektywny prąd zasilania	I1eff	32 A			16 A		
Courant d'alimentation maximal / Maximum supply current / Corriente de alimentación máxima / Maximale voedingsstroom / Corrente di alimentazione massima / Maksymalny prąd zasilania	I1max	48 A			39.4 A		
Section du cordon secteur / Mains cable section / Sectie netsnoer / Sección del cable de alimentación / Sezione del cavo di alimentazione / Odcinek przewodu zasilającego		3 x 2.5 mm <sup>2</sup>					
Puissance active maximale consommée / Maximum active power consumed / Consumo máximo de energía activa / Maximale actieve verbruikte vermogen / Potenza attiva massima consumata / Maksymalny pobór mocy czynne		8460 W					
Consommation au ralenti / Idle consumption / Consumo en ralentizado / Stationair verbruik / Consumo al minimo / Zużycie na biegu jałowym		30 W					
Rendement à I2max / Efficiency at I2max / Eficiencia a I2máx / Rendement bij I2max / Efficienza a I2max / Sprawność przy I2max		80 %					
Facteur de puissance à I2max / Power factor at I2max / Factor de potencia a I2max / Inschakelduur bij I2max / Ciclo di potenza a I2max / Współczynnik mocy przy I2max	λ	-					
Classe CEM / EMC class / Classe CEM / Klasse CEM / Classe CEM / Klasa EMC		A					
Secondaire / Secondary / Sekundär / Secundario / Вторичка / Secondair / Secundario		MMA AC MMA DC	TIG AC	TIG DC	MMA AC MMA DC	TIG AC	TIG DC
Tension à vide / No load voltage / Leerlaufspannung / Tensión al vacío / Напряжение холостого хода / Nulllastspanning / Tensione a vuoto	U0 (TCO)	55 V					
Tension à vide réduite (Tension VRD) / Reduced open circuit voltage (VRD voltage) / Tensión reducida en vacío (tensión VRD) / Nullastspanning (Spanning VRD) / Tensione a vuoto ridotta (Tensione VRD) / Obniżone napięcie biegu jałowego (Napięcie VRD)	Ur	26.5 V					
Nature du courant de soudage / Type of welding current / Tipo de corriente de soldadura / Type lasstroom / Tipo di corrente di saldatura / Rodzaj prądu spawania		AC / DC					
Modes de soudage / Welding modes / Modos de soldadura / Lasmodules / Modalità di saldatura / Tryby spawania		MMA, TIG					
Tension crête du dispositif d'amorçage manuel (EN60974-3) / Manual striking system's maximum voltage (EN60974-3) / Spitzenspannung des manuellen Startgerätes (EN60974-3) / Tensión pico del dispositivo de cebado manual (EN60974-3) / Пиковое напряжение механизма ручного поджига (EN60974-3) / Piekspanning van het handmatige startsysteem (EN60974-3) / Tensione di picco del dispositivo di innesco manuale (EN60974-3) / Napięcie szczytowe urządzenia do rozruchu ręcznego (EN60974-3)		12 kV					
Courant de soudage minimal / Minimum welding current / Corriente mínima de soldadura / Minimalas lasstroom / Corrente minima di saldatura / Minimalny prąd spawania		3 A					
Courant de sortie nominal / Rate current output / nominaler Arbeitsstrom / Corriente de salida nominal / Номинальный выходной ток / Nominala uitgangsstroom / Corrente di uscita nominale	I2	5 → 140 A	3 → 140 A	5 → 140 A	5 → 230 A	3 → 230 A	5 → 230 A
Tension de sortie conventionnelle / Conventional voltage output / entsprechende Arbeitsspannung / Условные выходные напряжения / Tensión de salida convencional / Conventionele uitgangsspanning / Tensione di uscita convenzionale	U2	20.2 → 25.6 V	10.12 → 15.6 V	10.2 → 15.6V	20.2 → 29.2 V	10.12 → 19.2 V	10.2 → 19.2 V
Facteur de marche à 40°C (10 min), Norme EN60974-1 / Duty cycle at 40°C (10 min), Standard EN60974-1. Einschaltdauer @ 40°C (10 min), EN60974-1-Norm / Ciclo de trabajo a 40°C (10 min), Norma EN60974-1 / ПВ% при 40°C (10 мин), Норма EN60974-1. / Inschakelduur bij 40°C (10 min), Norm EN60974-1, Ciclo di lavoro a 40°C (10 min), Norma EN60974-1.	I <sub>max</sub>	50 %	100 %	100 %	20 %	35 %	35 %
	60 %	130 A	140 A	140 A	160 A	190 A	190 A
	100 %	105 A	140 A	140 A	130 A	160 A	160 A
Pression maximale de gaz / Maximum gas pressure / Maximaler Gasdruck / Presión máxima del gas / Максимальное давление газа / Maximale gasdruk / Pressione massima del gas	P <sub>max</sub>	0.5 MPa (5 bar)					
Température de fonctionnement / Functioning temperature / Betriebstemperatur / Temperatura de funcionamiento / Рабочая температура / Gebruikstemperatuur / Temperatura di funzionamento		-10°C → +40°C					
Température de stockage / Storage temperature / Lagertemperatur / Temperatura de almacenaje / Температура хранения / Bewaartemperatuur / Temperatura di stoccaggio		-20°C → +55°C					
Degré de protection / Protection level / Schutzart / Grado de protección / Степень защиты / Beschermingsklasse / Grado di protezione		IP23					
Classe d'isolation minimale des enroulements / Minimum coil insulation class / Clase mínima de aislamiento del bobinado / Minimale isolatieklasse omwikkelingen / Classe minima di isolamento degli avvolgimenti / Minimalna klasa izolacji okablowania		B					
Dimensions (LxH) / Dimensions (LxWxH) / Abmessungen (Lxbxt) / Dimensiones (Ltxh) / Размеры (ДхШхВ) / Afmetingen (Ltxh) / Dimensioni (Ltxh)		49 x 26 x 44 cm					
Poids / Weight / Gewicht / Bec / Peso / Gewicht / Peso		22.4 kg					

		TITANIUM 400 AC/DC		
Primaire / Primary / Primär / Primario / Первичка / Primaire / Primario				
Tension d'alimentation / Power supply voltage / Versorgungsspannung / Tensión de red eléctrica / Напряжение питания / Voedingsspanning / Tensione di alimentazione	U1	400 V +/- 15%		
Fréquence secteur / Mains frequency / Netzfrequenz / Frecuencia / Частота сети / Frequentie sector / Frequenza settore		50 / 60 Hz		
Nombre de phases / Number of phases / Anzahl der Phasen / Número de fases / Количество фаз / Aantal fasen / Numero di fase		3		
Fusible disjoncteur / Fuse / Sicherung / Fusible disyuntor / Плавкий предохранитель прерывателя / Zekering hoofdschakelaar / Fusibile disgiuntore		32 A		
Courant d'alimentation effectif maximal / Maximum effective supply current / Corriente de alimentación efectiva máxima / Maximale effectieve voedingsstroom / Corrente di alimentazione effettiva massima / Maksymalny efektywny prąd zasilania	I1eff	29 A		
Courant d'alimentation maximal / Maximum supply current / Corriente de alimentación máxima / Maximale voedingsstroom / Corrente di alimentazione massima / Maksymalny prąd zasilania	I1max	37 A		
Section du cordon secteur / Mains cable section / Sectie netsnoer / Sección del cable de alimentación / Sezione del cavo di alimentazione / Odcinek przewodu zasilającego		4 x 4.0 mm <sup>2</sup>		
Puissance active maximale consommée / Maximum active power consumed / Consumo máximo de energía activa / Maximale actieve verbruikte vermogen / Potenza attiva massima consumata / Maksymalny pobór mocy czynne		17 150 W		
Consommation au ralenti / Idle consumption / Consumo en ralentizado / Stationair verbruik / Consumo al minimo / Zużycie na biegu jałowym		41.4 W		
Rendement à I2max / Efficiency at I2max / Eficiencia a I2máx / Rendement bij I2max / Efficienza a I2max / Sprawność przy I2max		84 %		
Facteur de puissance à I2max / Power factor at I2max / Factor de potencia a I2max / Inschakelduur bij I2max / Ciclo di potenza a I2max / Współczynnik mocy przy I2max	λ	0.66		
Classe CEM / EMC class / Classe CEM / Klasse CEM / Classe CEM / Klasa EMC				
Secondaire / Secondary / Sekundär / Secundario / Вторичка / Secondair / Secundario				
Tension à vide / No load voltage / Leerlaufspannung / Tensión al vacío / Напряжение холостого хода / Nullastspanning / Tensione a vuoto	U0 (TCO)	85 V		
Nature du courant de soudage / Type of welding current / Tipo de corriente de soldadura / Type lasstroom / Tipo di corrente di saldatura / Rodzaj prądu spawania		AC / DC		
Modes de soudage / Welding modes / Modos de soldadura / Lasmodules / Modalità di saldatura / Tryby spawania		MMA, TIG		
Tension crête du dispositif d'amorçage manuel (EN60974-3) / Manual striking system's maximum voltage (EN60974-3) / Spitzenspannung des manuellen Startergerätes (EN60974-3) / Tensión pico del dispositivo de cebado manual (EN60974-3) / Пиковое напряжение механизма ручного поджига (EN60974-3) / Piekspanning van het handmatige startsysteem (EN60974-3) / Tensione di picco del dispositivo di innesco manuale (EN60974-3) / Napięcie szczytowe urządzenia do rozruchu ręcznego (EN60974-3)		9 kV		
Courant de soudage minimal / Minimum welding current / Corriente mínima de soldadura / Minimale lasstroom / Corrente minima di saldatura / Minimalny prąd spawania		5 A	5 A	3 A
Courant de sortie nominal / Rate current output / nominaler Arbeitsstrom / Corriente de salida nominal / Номинальный выходной ток / Nominale uitgangsstroom / Corrente di uscita nominale	I2	5 → 400 A	5 → 400 A	3 → 400 A
Tension de sortie conventionnelle / Conventional voltage output / entsprechende Arbeitsspannung / Условное выходные напряжения / Tensión de salida convencional / Conventionele uitgangsspanning / Tensione di uscita convenzionale	U2	20.2 → 36 V	10.2 → 26 V	10.12 → 26 V
Facteur de marche à 40°C (10 min), Norme EN60974-1 / Duty cycle at 40°C (10 min), Standard EN60974-1.	60 %	400 A		
* Einschaltdauer @ 40°C (10 min), EN60974-1-Norm / Ciclo de trabajo a 40°C (10 min), Norma EN60974-1 / ПВ% при 40°C (10 мин), Норма EN60974-1. / Inschakelduur bij 40°C (10 min), Norm EN60974-1, Ciclo di lavoro a 40°C (10 min), Norma EN60974-1.	100 %	360 A		
Pression maximale de gaz / Maximum gas pressure / Maximaler Gasdruck / Presión máxima del gas / Максимальное давление газа / Maximale gasdruk / Pressione massima del gas				
	Pmax	0.5 MPa (5 bar)		
Température de fonctionnement / Functioning temperature / Betriebstemperatur / Temperatura de funcionamiento / Рабочая температура / Gebruikstemperatuur / Temperatura di funzionamento				
		-10°C → +40°C		
Température de stockage / Storage temperature / Lagertemperatur / Temperatura de almacenaje / Температура хранения / Bewaartemperatuur / Temperatura di stoccaggio				
		-20°C → +55°C		
Degré de protection / Protection level / Schutzart / Grado de protección / Степень защиты / Beschermingsklasse / Grado di protezione				
		IP23		
Classe d'isolation minimale des enroulements / Minimum coil insulation class / Clase mínima de aislamiento del bobinado / Minimale isolatieklasse omwikkelingen / Classe minima di isolamento degli avvolgimenti / Minimalna klasa izolacji okablowania				
		B		
Dimensions (LxIxH) / Dimensions (LxIxH) / Abmessungen (LxBxH) / Dimensiones (LxIxH) / Размеры (ДxШxВ) / Afmetingen (LxIxH) / Dimensioni (LxIxH)				
		71 x 27 x 48 cm		
Poids / Weight / Gewicht / Bec / Peso / Gewicht / Peso				
		39.7 Kg		

\*Les facteurs de marche sont réalisés selon la norme EN60974-1 à 40°C et sur un cycle de 10 min. Lors d'utilisation intensive (supérieur au facteur de marche) la protection thermique peut s'enclencher, dans ce cas, l'arc s'éteint et le témoin  $\downarrow$  s'allume. Laissez l'appareil alimenté pour permettre son refroidissement jusqu'à annulation de la protection. La source de courant décrit une caractéristique de sortie de type tombante. Dans certains pays, U0 est appelé TCO.

\*The duty cycles are measured according to standard EN60974-1 at 40°C and on a 10 min cycle. While under intensive use (> to duty cycle) the thermal protection can turn on, in that case, the arc switches off and the indicator  $\downarrow$  switches on. Keep the machine's power supply on to enable cooling until thermal protection cancellation. The welding power source describes an external drooping characteristic. In some countries, U0 is called TCO.

\* Einschaltdauer gemäß EN60974-1 (10 Minuten - 40°C). Bei sehr intensivem Gebrauch (>Einschaltdauer) kann der Thermoschutz ausgelöst werden. In diesem Fall wird der Lichtbogen abgeschaltet und die entsprechende Warnung  $\downarrow$  erscheint auf der Anzeige. Das Gerät zum Abkühlen nicht ausschalten und laufen lassen bis das Gerät wieder bereit ist. Das Gerät entspricht in seiner Charakteristik einer Spannungsquelle mit fallender Kennlinie. In einigen Ländern wird U0 als TCO bezeichnet.

\*Los ciclos de trabajo están realizados en acuerdo con la norma EN60974-1 a 40°C y sobre un ciclo de diez minutos. Durante un uso intensivo (superior al ciclo de trabajo), se puede activar la protección térmica. En este caso, el arco se apaga y el indicador  $\downarrow$  se enciende. Deje el aparato conectado para permitir que se enfríe hasta que se anule la protección. La fuente de corriente de soldadura posee una salida de tipo corriente constante. En algunos países, U0 se llama TCO.










\*ПВ% указаны по норме EN60974-1 при 40°C и для 10-минутного цикла. При интенсивном использовании (> ПВ%) может включиться тепловая защита. В этом случае дуга погаснет и загорится индикатор  $\downarrow$ . Оставьте аппарат подключенным к питанию, чтобы он охлад до полной отмены защиты. Аппарат описывает падающую характеристику на выходе. В некоторых странах U0 называется TCO.

\*De inschakelduur is gemeten volgens de norm EN60974-1 bij een temperatuur van 40°C en bij een cyclus van 10 minuten. Bij intensief gebruik (superieur aan de inschakelduur) kan de thermische beveiliging zich in werking stellen. In dat geval gaat de boog uit en gaat het beveiligingslampje  $\downarrow$  gaat branden. Laat het apparaat aan de netspanning staan om het te laten afkoelen, totdat de beveiliging afslaat. Het apparaat heeft een uitgaande dalende eigenschap. In sommige landen wordt U0 TCO genoemd.

\*I cicli di lavoro sono realizzati secondo la norma EN60974-1 a 40°C e su un ciclo di 10 min. Durante l'uso intensivo (> al ciclo di lavoro) la protezione termica può attivarsi, in questo caso, l'arco si spegne e la spia  $\downarrow$  si illumina. Lasciate il dispositivo collegato per permetterlo il raffreddamento fino all'annullamento della protezione. La fonte di corrente di saldatura presenta una caratteristica di uscita spiovente. In alcuni Paesi, U0 viene chiamata TCO.

## SYMBOLS / ZEICHENERKLÄRUNG / ICONOS / СИМВОЛЫ / PICTOGRAMMEN / ICONE

	<b>FR</b> Attention ! Lire le manuel d'instruction avant utilisation. <b>EN</b> Warning ! Read the user manual before use. <b>DE</b> ACHTUNG ! Lesen Sie diese Anleitung sorgfältig durch vor Inbetriebnahme des Geräts. <b>ES</b> ¡Atención! Lea el manual de instrucciones antes de su uso. <b>RU</b> Внимание! Прочтите инструкцию перед использованием. <b>NL</b> Let op! Lees aandachtig de handleiding. <b>IT</b> Attenzione! Leggere il manuale d'istruzioni prima dell'uso.
	<b>FR</b> Symbole de la notice <b>EN</b> User manual symbol <b>DE</b> Symbole in der Bedienungsanleitung <b>ES</b> Símbolo del manual <b>RU</b> Символы, используемые в инструкции <b>NL</b> Symbol handleiding <b>IT</b> Simbolo del manuale
	<b>FR</b> Source de courant de technologie onduleur délivrant un courant C.C. et C.A. <b>EN</b> Inverter technology current source delivering DC and AC current. <b>DE</b> Inverter-Wechsel-/Gleichstromquelle. <b>ES</b> Fuente de corriente de tecnología ondulador que libera una corriente CC o CA. <b>RU</b> Источник тока с технологией преобразователя, выдающий постоянный и переменный токи. <b>NL</b> Stroombron met UPS technologie, levert gelijkstroom en wisselstroom. <b>IT</b> Fonte di corrente di tecnologia inverter rilasciando una corrente C.C. e C.A.
	<b>FR</b> Source de courant de technologie onduleur délivrant un courant C.C. et C.A. <b>EN</b> Inverter technology current source delivering DC and AC current. <b>DE</b> Inverter-Wechsel-/Gleichstromquelle. <b>ES</b> Fuente de corriente de tecnología ondulador que libera una corriente CC o CA. <b>RU</b> Источник тока с технологией преобразователя, выдающий постоянный и переменный токи. <b>NL</b> Stroombron met UPS technologie, levert gelijkstroom en wisselstroom. <b>IT</b> Fonte di corrente di tecnologia inverter rilasciando una corrente C.C. e C.A.
	<b>FR</b> Soudage à l'électrode enrobée - MMA (Manual Metal Arc) <b>EN</b> MMA welding (Manual Metal Arc) <b>DE</b> Schweißen mit umhüllter Elektrode (E-Handschweißen) <b>ES</b> Soldadura con electrodo revestido (MMA - Manual Metal Arc) <b>RU</b> Сварка электродом с обмазкой: MMA (Manual Metal Arc) <b>NL</b> Lassen met beklede elektrode - MMA (Manual Metal Arc) <b>IT</b> Saldatura all'elettrodo rivestito - MMA (Manual Metal Arc).
	<b>FR</b> Soudage TIG (Tungsten Inert Gaz) <b>EN</b> TIG welding (Tungsten Inert Gas) <b>DE</b> TIG- (WIG-)Schweißen (Tungsten (Wolfram) Inert Gas) <b>ES</b> Soldadura TIG (Tungsten Inert Gaz) <b>RU</b> Сварка TIG (Tungsten Inert Gaz) <b>NL</b> TIG lassen (Tungsten Inert Gaz) <b>IT</b> Saldatura TIG (Tungsten Inert Gaz).
	<b>FR</b> Convient au soudage dans un environnement avec risque accru de choc électrique. La source de courant elle-même ne doit toutefois pas être placée dans de tels locaux. <b>EN</b> Suitable for welding in an environment with an increased risk of electric shock. However this a machine should not be placed in such an environment. <b>DE</b> Geeignet für Schweißarbeiten im Bereich mit erhöhten elektrischen Risiken. <b>ES</b> Adaptado para soldadura en lugar con riesgo de choque eléctrico. Sin embargo, la fuente eléctrica no debe estar presente en dichos lugares. <b>RU</b> Подходит для сварки в среде с повышенным риском удара током. В этом случае источник тока не должен находиться в том же самом помещении. <b>NL</b> Geschikt voor het lassen in een ruimte met verhoogd risico op elektrische schokken. De voedingsbron zelf moet echter niet in dergelijke ruimte worden geplaatst. <b>IT</b> Conviene alla saldatura in un ambiente a grande rischio di scosse elettriche. L'origine della corrente non deve essere localizzata in tale posto.
	<b>FR</b> Courant de soudage continu <b>EN</b> Direct welding current <b>DE</b> Gleichschweißstrom <b>ES</b> Corriente de soldadura continua. <b>RU</b> Постоянный сварочный ток <b>NL</b> Gelijkstroom <b>IT</b> Corrente di saldatura continuo
	<b>FR</b> Symbole du courant alternatif <b>EN</b> Alternative current symbol <b>DE</b> Symbol Wechselstrom <b>ES</b> Símbolo de corriente alterna <b>RU</b> Символ переменного тока <b>NL</b> Symbol wisselstroom <b>IT</b> Simbolo di corrente alternata
	<b>FR</b> Courant de soudage continu et alternatif <b>EN</b> Direct and alternating welding current <b>DE</b> Gleich- und Wechselstrom <b>ES</b> Corriente de soldadura continua y alterna. <b>RU</b> Постоянный и переменный сварочный ток. <b>NL</b> Gelijkstroom en wisselstroom <b>IT</b> Corrente di saldatura continua e alternata
U <sub>0</sub>	<b>FR</b> Tension assignée à vide <b>EN</b> Open circuit voltage <b>DE</b> Leerlaufspannung <b>ES</b> Tensión asignada en vacío <b>RU</b> Номинальное напряжение холостого хода <b>NL</b> Nullaastspanning <b>IT</b> Tensione nominale a vuoto
U <sub>r</sub>	<b>FR</b> Tension à vide réduite assignée dans le cas d'un dispositif réducteur de tension <b>EN</b> Rated reduced open circuit voltage in the case of a voltage reducing device <b>DE</b> Bemessene reduzierte Leerlaufspannung im Falle einer spannungsreduzierenden Vorrichtung. <b>ES</b> Tensión nominal de circuito abierto reducida en el caso de un dispositivo reductor de tensión <b>RU</b> Номинальное пониженное напряжение разомкнутой цепи в случае использования устройства снижения напряжения <b>NL</b> Nominale gereduceerde open kringspanning in geval van een spanningsverlagende voorziening <b>IT</b> Tensione nominale ridotta a circuito aperto nel caso di un dispositivo di riduzione della tensione
U <sub>p</sub>	<b>FR</b> Tension de crête assignée <b>EN</b> Rated peak voltage <b>DE</b> Nenn-Spitzenspannung <b>ES</b> Tensión nominal de pico <b>RU</b> Номинальное пиковое напряжение <b>NL</b> Nominale piekspanning <b>IT</b> Tensione nominale di picco
X(40°C)	<b>FR</b> Facteur de marche selon la norme EN60974-1 (10 minutes - 40°C). <b>EN</b> Duty cycle according to standard EN 60974-1 (10 minutes - 40°C). <b>DE</b> Einschaltdauer: 10 min - 40°C, richtlinienkonform EN60974-1. <b>ES</b> Ciclo de trabajo según la norma EN60974-1 (10 minutos - 40°C). <b>RU</b> ПВ% согласно нормам EN 60974-1 (10 минут - 40°C). <b>NL</b> Inschakelduur volgens de norm EN60974-1 (10 minuten - 40°C). <b>IT</b> Ciclo di lavoro conforme alla norma EN60974-1 (10 minuti - 40°C).
I <sub>2</sub>	<b>FR</b> Courant de soudage conventionnel correspondant <b>EN</b> Corresponding conventional welding current <b>DE</b> Entsprechender Schweißstrom <b>ES</b> Corriente de soldadura convencional correspondiente. <b>RU</b> Соответствующий номинальный сварочный ток <b>NL</b> Corresponderende conventionele lasstroom <b>IT</b> Corrente di saldatura convenzionale.
A	<b>FR</b> Ampères <b>EN</b> Amperes <b>DE</b> Ampere <b>ES</b> Amperios <b>RU</b> Амперы <b>NL</b> Ampère <b>IT</b> Amper
U <sub>2</sub>	<b>FR</b> Tensions conventionnelles en charges correspondantes <b>EN</b> Conventional voltage in corresponding loads. <b>DE</b> Entsprechende Arbeitsspannung <b>ES</b> Tensiones convencionales en cargas correspondientes. <b>RU</b> Номинальные напряжения при соответствующих нагрузках. <b>NL</b> Conventionele spanning in corresponderende belasting <b>IT</b> Tensioni convenzionali in cariche corrispondenti
V	<b>FR</b> Volt <b>EN</b> Volt <b>DE</b> Volt <b>ES</b> Voltio <b>RU</b> Вольт <b>NL</b> Volt <b>IT</b> Volt
Hz	<b>FR</b> Hertz <b>EN</b> Hertz <b>DE</b> Hertz <b>ES</b> Hercios <b>RU</b> Герц <b>NL</b> Hertz <b>IT</b> Hertz
	<b>FR</b> Alimentation électrique monophasée 50 ou 60Hz <b>EN</b> Single phase power supply 50 or 60 Hz <b>DE</b> Einphasige Netzversorgung mit 50 oder 60Hz <b>ES</b> Alimentación eléctrica monofásica 50 o 60Hz <b>RU</b> Однофазное электропитание 50 или 60Гц <b>NL</b> Enkelfase elektrische voeding 50Hz of 60Hz. <b>IT</b> Alimentazione elettrica monofase 50 o 60Hz. <b>PL</b> Zasilanie jednofazowe 50 lub 60Hz
	<b>FR</b> Alimentation électrique triphasée 50 ou 60Hz <b>EN</b> Three-phase power supply 50 or 60Hz <b>DE</b> Dreiphasige Netzversorgung mit 50 oder 60Hz <b>ES</b> Alimentación eléctrica trifásica 50 o 60Hz <b>RU</b> Трёхфазное электропитание 50 или 60Гц <b>NL</b> Driefasen elektrische voeding 50Hz of 60Hz. <b>IT</b> Alimentazione elettrica trifase 50 o 60Hz
U <sub>1</sub>	<b>FR</b> Tension assignée d'alimentation <b>EN</b> Assigned voltage <b>DE</b> Netzspannung <b>ES</b> Tensión asignada de alimentación eléctrica. <b>RU</b> Номинальное напряжение питания <b>NL</b> Nominale voedingspanning <b>IT</b> Tensione nominale d'alimentazione
I <sub>1max</sub>	<b>FR</b> Courant d'alimentation assigné maximal (valeur efficace) <b>EN</b> Maximum rated power supply current (effective value). <b>DE</b> Maximaler Versorgungsstrom <b>ES</b> Corriente de alimentación eléctrica asignada máxima (valor eficaz). <b>RU</b> Максимальный сетевой ток (эффективное значение) <b>NL</b> Maximale nominale voedingsstroom (effectieve waarde) <b>IT</b> Corrente d'alimentazione nominale massima (valore effettivo)
I <sub>1eff</sub>	<b>FR</b> Courant d'alimentation effectif maximal <b>EN</b> Maximum effective power supply current. <b>DE</b> Maximaler effektiver Versorgungsstrom <b>ES</b> Corriente de alimentación eléctrica máxima. <b>RU</b> Максимальный эффективный сетевой ток <b>NL</b> Maximale effectieve voedingsstroom <b>IT</b> Corrente effettiva massimo di alimentazione
	<b>FR</b> Matériel conforme aux Directives européennes. La déclaration UE de conformité est disponible sur notre site (voir à la page de couverture). <b>EN</b> Device complies with european directives, The EU declaration of conformity is available on our website (see cover page). <b>DE</b> Gerät entspricht europäischen Richtlinien. Die Konformitätserklärung finden Sie auf unsere Webseite. <b>ES</b> Aparato conforme a las directivas europeas. La declaración de conformidad UE está disponible en nuestra página web (dirección en la portada). <b>RU</b> Устройство соответствует директивам Евросоюза. Декларация о соответствии доступна для просмотра на нашем сайте (ссылка на обложке). <b>NL</b> Apparaat in overeenstemming met de Europese richtlijnen. De verklaring van overeenstemming is te downloaden op onze website (adres vermeld op de omslag). <b>IT</b> Materiale in conformità alle Direttive europee. La dichiarazione di conformità è disponibile sul nostro sito (vedere sulla copertina).

	<b>FR</b> Matériel conforme aux exigences britanniques. La déclaration de conformité britannique est disponible sur notre site (voir à la page de couverture). <b>EN</b> Equipment in compliance with British requirements. The British Declaration of Conformity is available on our website (see home page). <b>DE</b> Das Gerät entspricht den britischen Richtlinien und Normen. Die Konformitätserklärung für Grossbritannien ist auf unserer Internetseite verfügbar (siehe Titelseite). <b>ES</b> Equipo conforme a los requisitos británicos. La Declaración de Conformidad Británica está disponible en nuestra página web (véase la portada). <b>RU</b> Материал соответствует требованиям Великобритании. Заявление о соответствии для Великобритании доступно на нашем веб-сайте (см. главную страницу). <b>NL</b> Materiaal conform aan de Britse eisen. De Britse verklaring van overeenkomst is beschikbaar op onze website (zie omslagpagina). <b>IT</b> Materiale conforme alla esigenze britanniche. La dichiarazione di conformità britannica è disponibile sul nostro sito (vedere pagina di copertina).
	<b>FR</b> Matériel conforme aux normes Marocaines. La déclaration C <sub>p</sub> (CMIM) de conformité est disponible sur notre site (voir à la page de couverture). <b>EN</b> Equipment in conformity with Moroccan standards. The declaration C <sub>p</sub> (CMIM) of conformity is available on our website (see cover page). <b>DE</b> Das Gerät entspricht die marokkanischen Standards. Die Konformitätserklärung C <sub>p</sub> (CMIM) ist auf unserer Webseite verfügbar (siehe Titelseite). <b>ES</b> Equipamiento conforme a las normas marroquíes. La declaración de conformidad C <sub>p</sub> (CMIM) está disponible en nuestra página web (ver página de portada). <b>RU</b> Товар соответствует нормам Марокко. Декларация C <sub>p</sub> (CMIM) доступна для скачивания на нашем сайте (см на титульной странице). <b>NL</b> Dit materiaal voldoet aan de Marokkaanse normen. De verklaring C <sub>p</sub> (CMIM) van overeenstemming is beschikbaar op onze internet site (vermeld op de omslag). <b>IT</b> Materiale conforme alle normative marocchine. La dichiarazione C <sub>p</sub> (CMIM) di conformità è disponibile sul nostro sito (vedi scheda del prodotto).
IEC 60974-1 IEC 60974-10 Class A	<b>FR</b> L'appareil respecte la norme EN60974-1 et EN60971-10 appareil de classe A. <b>EN</b> The device is compliant with standard EN60974-1 and EN60971-10 class A device. <b>DE</b> Das Gerät erfüllt die Norm EN 60974-1 und EN 60971-10 der Gerätekategorie A. <b>ES</b> El aparato se ajusta a la norma EN60974-1 y EN 60971-10, aparato de clase A. <b>RU</b> Аппарат соответствует нормам EN60974-1 и EN60971-10 аппарат класса А. <b>NL</b> Dit klasse A apparaat voldoet aan de EN60974-1 en EN60971-10 normen. <b>IT</b> Il dispositivo rispetta la norma EN60974-1 e EN 60971-10 dispositivo classe A.
IEC 60974-3	<b>FR</b> L'appareil respecte la norme EN 60974-3. <b>EN</b> This product is compliant with standard EN 60974-3. <b>DE</b> Das Gerät entspricht der Norm EN 60974-3. <b>ES</b> El aparato es conforme a las normas EN60974-3. <b>RU</b> Аппарат соблюдает нормы EN 60974-3. <b>NL</b> Het apparaat voldoet aan de norm EN 60974-3. <b>IT</b> Il dispositivo rispetta la norma EN 60974-3.
	<b>FR</b> Ce matériel faisant l'objet d'une collecte sélective selon la directive européenne 2012/19/UE. Ne pas jeter dans une poubelle domestique ! <b>EN</b> This hardware is subject to waste collection according to the European directives 2012/19/EU. Do not throw out in a domestic bin ! <b>DE</b> Für die Entsorgung Ihres Gerätes gelten besondere Bestimmungen (sondermüll) gemäß europäische Bestimmung 2012/19/EU. Es darf nicht mit dem Hausmüll entsorgt werden! <b>ES</b> Este material requiere una recogida de basuras selectiva según la directiva europea 2012/19/UE. ¡No tirar este producto a la basura doméstica! <b>RU</b> Это оборудование подлежит переработке согласно директиве Евросоюза 2012/19/UE. Не выбрасывать в общий мусоросборник! <b>NL</b> Afzonderlijke inzameling vereist volgens de Europese richtlijn 2012/19/UE. Gooi het apparaat niet bij het huishoudelijk afval ! <b>IT</b> Questo materiale è soggetto alla raccolta differenziata seguendo la direttiva europea 2012/19/UE. Non smaltire con i rifiuti domestici!
	<b>FR</b> Produit recyclable qui relève d'une consigne de tri. <b>EN</b> This product should be recycled appropriately <b>DE</b> Recyclingprodukt, das gesondert entsorgt werden muss. <b>ES</b> Producto reciclable que requiere una separación determinada. <b>RU</b> Этот аппарат подлежит утилизации. <b>NL</b> Product recyclebaar, niet bij het huishoudelijk afval gooien <b>IT</b> Prodotto riciclabile soggetto a raccolta differenziata.
	<b>FR</b> Marque de conformité EAC (Communauté économique Eurasienne) <b>EN</b> EAEC Conformity marking (Eurasian Economic Community). <b>DE</b> EAC-Konformitätszeichen (Eurasische Wirtschaftsgemeinschaft) <b>ES</b> Marca de conformidad EAC (Comunidad económica euroasiática). <b>RU</b> Знак соответствия EAC (Евразийское экономическое сообщество) <b>NL</b> EAC (Euraziatische Economische Gemeenschap) merkteken van overeenstemming <b>IT</b> Marca di conformità EAC (Comunità Economica Eurasiatica)
	<b>FR</b> Information sur la température (protection thermique) <b>EN</b> Temperature information (thermal protection) <b>DE</b> Information zur Temperatur (Thermoschutz) <b>ES</b> Información sobre la temperatura (protección térmica) <b>RU</b> Информация по температуре (термозащита). <b>NL</b> Informatie over de temperatuur (thermische beveiliging) <b>IT</b> Informazioni sulla temperatura (protezione termiche)
	<b>FR</b> Entrée de gaz <b>EN</b> Gas input <b>DE</b> Gaseingang <b>ES</b> Entrada de gas <b>RU</b> Подача газа <b>NL</b> Ingang gas <b>IT</b> Entrata di gas
	<b>FR</b> Sortie de gaz <b>EN</b> Gas output <b>DE</b> Gasausgang <b>ES</b> Salida de gas <b>RU</b> Выход газа <b>NL</b> Uitvoer gas <b>IT</b> Uscita di gas
	<b>FR</b> Commande à distance <b>EN</b> Remote control <b>DE</b> Fernregler <b>ES</b> Control a distancia <b>RU</b> Дистанционное управление <b>NL</b> Afstandsbediening. <b>IT</b> Telecomando a distanza

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